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ABSTRACT

Following a summary of the discussions of an intensive training course on education, employment, and work conducted in Botswana, this document contains the following 18 papers presented at the training course: "Education and Employment in Africa: An Overview" (Sanyal); "Diagnosis of the Employment Situation: Some Basic Concepts" (Varghese); "Exercise: Diagnosis of the Employment Situation (Sanyal); "Estimation of Manpower Demand and Supply" (Sanyal); "Projecting Manpower Demand and Supply: An Exercise on Sri Lanka" (Varghese); "Earning Functions: The Theory" (Camara); "Practical Exercises on: The Earnings Function" (Kann, Sanyal); "Theories of Labour Market" (Varghese); "Tracer Studies to Relate Education with Employment for Development of Human Resources" (Sanyal); "Tracer Studies in Botswana" (Kann, Chilisa); "Practical Exercises on Tracer Studies" (Sanyal, Kann); "The Informal and Micro-enterprise Economy in Africa: New Challenges for Planners" (King); "Botswana's Informal Sector" (Kann); "An Exploration of the Informal Sector in Gaborone: Results of an Informal Survey'" (Kann); "Education and Productive Work" (Hoppers); "Gender, Education, Work and Earnings in Botswana" (Kann); "An Occupational Information System for Botswana" (Nkambwe); and "Strategies for a Better Match between Education and Employment: A Synthesis of Discussions and Ideas" (Sanyal, Varghese, and Hoppers). Appended to the document are an opening address by K. P. Morake, Botswana Minister of Education, and a closing statement by P. H. K. Kedikilwe, Minister of Presidential Affairs and Public Administration, the workshop program, and a list of participants. (KC)

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Education, employment and work

Report of an intensive training course

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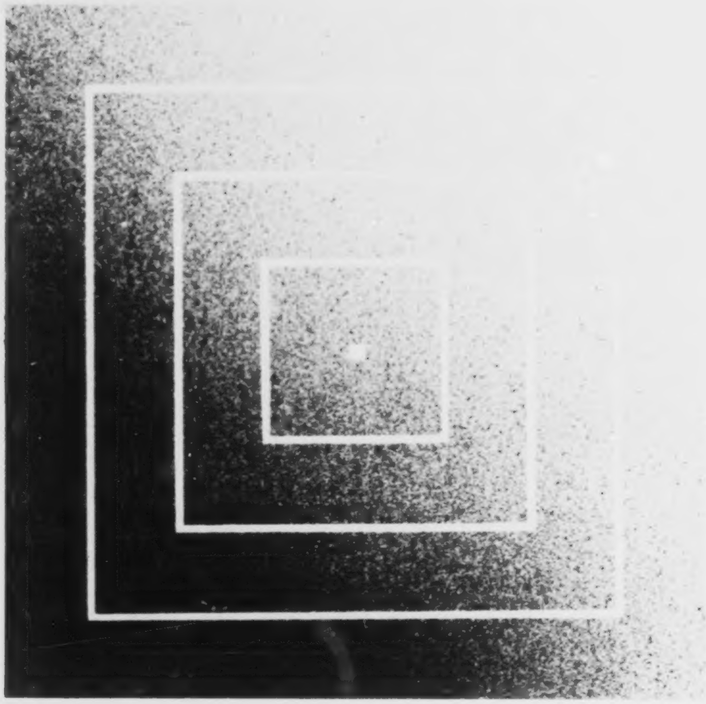

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Gaborone, Botswana
27 June - 14 July 1989

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Unesco Regional Office for Education in Africa, Senegal

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Intensive training course on Education, Employment and Work

Report

by

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Chapter 1

Background and resume of discussions

The Background

Unemployment and under-employment especially among the educated has become a common phenomenon in the developing countries. The low rate of labour absorption resulting from the slowing down of economic growth in the recent past accompanied by a fast growing labour force has aggravated the situation.

The educational system is often blamed for producing 'unemployables'. The challenge for educational planners is to find ways and means to see that the skill formation process is in line with the requirements of the employment sectors. This in the present context will mean frequent and periodic diagnostic studies of the changing contexts, identifying the critical parameters and readjusting the planning tools to suit the emerging requirements of the economy.

The International Institute for Educational Planning (IIEP) has undertaken and completed many studies on the theme. These empirical evidences have provided a wealth of information and experience to the Institute to suggest methods of planning education to link it with employment. The present workshop organized jointly by IIEP, BREDA (Dakar) and N.I.R. (University of Botswana) is an attempt in the direction of training educational/employment planners in the SADCC region.

Objectives of the programme

The objectives of the Training Seminar were:

(i) to sensitize the participants regarding the general context in which education and employment are to be analyzed;
(ii) to familiarize the participants with the basic concepts and their application in the area of education and employment;
(iii) to train participants in various techniques used to relate educational development to employment needs in the national and regional context; and
(iv) to discuss alternative strategies to link education with employment.

Participation

The participants were drawn from the SADDC and adjacent countries. The workshop had representatives from Botswana, Kenya, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. The participants were responsible officers from the Ministries of Education, Planning and/or Labour or researchers at Universities or persons responsible for training educational planners at the national level.

Resource persons

The following persons acted as the resource persons of the programme:

Bikas C. Sanyal
Kenneth King
T. Nyamadzabo
P. van Rensburg
S. Seisa
Ulla Kann
Wim Hoppers
J. Salkin
M. Overeem
W. Sibanda
N.V. Varghese
B. Camara
B. Chilisa
M. Nkambwe
G. Wiman

Venue and date

The programme was inaugurated by the Minister of Education (Botswana) the Hon. Mr. K.P. Morake and Dr. B.C. Sanyal of IIEP gave the keynote address.

The Minister in his address called the attention of the participants to the problem of unemployment among young educated people, especially - Junior Certificate holders, in Botswana. According to him one of the reasons for an increase in unemployment in Botswana is the fast growth of the population. Therefore he argued for initiating effective steps to slow down population growth. The other reason, is the fast expanding educational system which does not provide adequate skills. In his view the major problem in Botswana is "too much education and too little training".

In the latter part of his speech the Minister highlighted various efforts undertaken by the government to improve the training programmes in Botswana. He underlined the importance of the role played by the private sector in this regard, especially in the field of computer operation.

In his view self-employment and employment in the informal sectors of the economy should be encouraged in the years to come. (Full text of the speech is given in Appendix I).

Dr. Sanyal in his keynote address highlighted the complexities of the relationship between education and employment in the context of the participating countries of the region (see next section).

1. Education and employment: the SADCC context

1.1 The historical context

Most African economies were subsistence agrarian before the advent of colonial western industrial civilization. Agricultural and associated activities were based less on the formal systems of skill formation. The family, the work place and skill formation were part and parcel of the cultural tradition and religious orientation of each of these societies. Individual socialisation, the work tradition and skill formation were inextricably combined and embedded in the same social process.

The advent of colonialism witnessed differentiation and transformation of this mode of social process. The evolution of tiny industrial enclaves and commercial centres separated the centres of learning from the centres of production. The education and training system became formalized and oriented towards meeting the immediate needs of the colonial rulers. The focus of manpower development through the formal systems was on producing trained personnel at the subordinate level well versed in the language of the colonial masters. Consequently over a period of time formal education and language competency became essential and preferable characteristics required for modern sector jobs. Independence brought about a different orientation to the educational system. The expansion of the educational system at all levels became a major concern. And expansion did take place, being linear and generally faster than the economic sectors, paving the way for unemployment and under-employment of the educated. Consequently most countries face the problem of inadequate expansion of the educational system on the one hand (reflected in terms of illiteracy) and unemployment of the educated on the other. Recent discussions on the changing orientation of the education and skill formation process in these countries needs to be seen in this context.

1.2 Some recent trends

Growth of the educational system

The educational system expanded considerably in all the SADCC countries during their post independence period. The recent trends in the pattern of expansion of the educational system in the countries represented can be grouped into three:

(i) Countries where rates of growth of the system are positively associated with the levels of education i.e. growth rates are higher at the higher levels of education. Countries like Botswana, Kenya, Lesotho, Malawi, Mozambique and Swaziland belong to this category. In these countries, during the period between 1975-86, the higher education sector expanded at a faster rate than that of the secondary education sector and the secondary education sector expanded at a faster rate than the primary education sector.

(ii) The countries where secondary education expanded at a faster rate than that of other levels of education. Countries like Uganda, Zambia, and Zimbabwe. In these countries secondary education expanded at a faster rate followed by primary and higher education sectors.

(iii) Countries where primary education expanded at a faster rate than secondary and higher education. Tanzania is the only country in this region which belongs to this category.

Growth of the labour force

The rate of growth of the labour force in African countries, in general, increased in the eighties (around 2.5%) when compared to the sixties (around 2%). The pattern of growth of the labour force in these countries can again be classified into three:

(i) Countries where the rates of growth of labour force not only continued to be high in the past but also surpassed these high growth rates in the eighties. Countries like Kenya, Malawi, Tanzania and Zambia belong to this category. The high rates of growth of population may be one of the important explanations for this trend. For example, the population projections for Kenya for the year 2000 show that it will more than double during the period between 1979 and 2000.

(ii) Countries where the rates of growth of labour force slowed down during the eighties. Countries like Uganda, Zambia and Zimbabwe belong to this category. In many of these countries, the rates of growth of labour force were relatively high in the past and continue to be moderately high in the eighties also. However, the rates have definitely slowed down.

(iii) Countries where the rates of growth of labour force were very low and continue to be low in the eighties. Mozambique belongs to this category.

Growth of the economy

Countries represented in the workshop vary in their GNP per capita. As per the 1988 World Development Report, Malawi has the lowest GNP per capita with US$160 and Botswana has the highest with US$840. In terms of rates of growth of GNP there are countries like Botswana which experienced 11.9 per cent growth in the eighties while countries like Mozambique (-9%) and Zambia (0-1%) experienced negative growth rates. Perhaps, these two are extreme cases. Most other countries experienced a moderate rate of growth (Kenya 3.4%, Zimbabwe 2.6%, Malawi 2.4%). In the case of other countries, the growth rates were marginal (Uganda .7%, Lesotho and Tanzania .9%).

In terms of sectorial growth, in all countries except Botswana, Swaziland and Zambia, the service sectors grew at a faster rate than the agricultural and industrial sectors. Botswana experienced a leap in the industrial sector with 19.1 per cent growth while the agricultural sector showed a negative growth rate to the extent of -9.8 per cent. In Swaziland, agricultural and industrial sectors grew at faster rates than the service sector, whereas in Zambia the growth rates of the service and industrial sectors were negative.

Employment and unemployment

Though these countries show varying patterns in terms of growth in education, labour force and economy, they have more in common and hence show generalizable patterns in terms of the employment and unemployment situation. Of course, countries like Botswana face a shortage of skilled manpower and a surplus of unskilled, especially Junior Certificate leavers.

The situation shows a continuing deterioration of employment in general and that of the educated especially, i.e. secondary and higher educated. This can be partly explained by the slowing down of economic growth accompanied by a faster growth of the labour force - in the sixties the rates of growth of the economy were faster than that of the labour force in many of these countries. However, in the eighties the rates of growth of the labour force surpassed that of the economy giving rise to the ever increasing problem of unemployment.

Even when rates of unemployment are low, the level of under-employment is relatively high in many of the countries. The recent decline or stagnation of economic growth has affected different segments differently in terms of incidence of unemployment and under-employment.

The recent economic decline and stagnation has resulted in:

(i) a decline in the formal sector of employment;
(ii) a decline in real wages especially in the formal sector;
(iii) a rise in open unemployment and under-employment among the educated especially in the urban areas.

A decline in real wages in the formal sectors has some consequences for the labour structure in many of the countries. It has reduced the wage differentials between rural and urban areas on the one hand and between educated and less educated on the other.

Consequently rural-urban migration has declined. The rural areas, on the other hand, are less affected by these trends. But it needs to be noted that in countries where there was a negative growth in agriculture (Botswana, Mozambique and Uganda) the problem of under-employment in the rural areas has increased.

Since most of the educated are employed in the formal sectors, a decline in real wages has adversely affected the educated, under-employment among them has increased. At the same time the earning differentials between the educated and less educated (especially of rural areas) has narrowed. This perhaps may have an adverse impact on the demand for higher levels of education.

Another significant impact of the decline in the wage gap is the steady growth of the informal sector in many of these countries. The urban informal sector has grown tremendously in all the countries. At present it accounts for nearly 50 per cent of the urban labour force. This phenomenon has important implications for the educational and training systems in these countries.

The educational system is increasingly blamed for not producing individuals with relevant skills. And in many countries of the region the trend is towards vocational education. Different countries have adopted different programmes to adjust skills development to suit changing economic and employment conditions. Examples are numerous. Zambia has adopted a programme (SELP) for the self-employment of school leavers. Uganda has introduced an accelerated training programme and the special public works programme with the financial assistance of ILO. The objective of the policy is to transform job seekers to job-makers. Kenya has introduced the 'Jua Kali' project. The 'Harambee Spirit' makes the programme run successfully.

1.3 Conclusions

Unemployment and under-employment are wide-spread among most countries of the region. Unemployment is higher among the youth and among women. The recent decline in economic growth has accentuated the problem of unemployment and under-employment especially among the educated. Real wages have declined which has narrowed earning differentials between rural and urban areas; between formal and informal sector employees of the urban areas and between the more and less educated. Consequently, informal sectors have become more attractive. At present the informal sector accounts for nearly half of the urban labour force in many of the countries.

A shift to urban informal sectors needs a re-orientation in the education and skill development policies of these countries. Many countries are adopting different programmes to face the situation. Often these new programmes are dependent upon donor agencies. The political climate and the attitudes of the donor agencies will determine their success.

Finally, the future expansion of employment is to be sought in the informal and self-employment sectors. Hence there is a need to focus educational and training policies towards satisfying the needs of this sector. This will come for a departure from the traditional methods of planning education.

2. Education and employment: some concepts and techniques

2.1 Some basic concepts

Labour force

The labour force consists of all the economically active population. It includes both employed and unemployed. The Labour Force Participation Rate (LFPR) is the percentage of total labour force to total population. Generally, population aged ten and above is considered for calculating LFPR.

Certain general trends in the LFPR are as follows:

(i) LFPR of men and women below the age of 25 declines with increase in access to education.
(ii) LFPR of men and women above the age of sixty declines with increase in provisions for old age benefits and other social security measures.
(iii) LFPR of men between the age groups 25 and 55 change marginally.
(iv) LFPR of working age women vary widely between countries and regions.

The LFPR among the participating countries declined during the period between 1950 and 1985. This is a trend common in the developing countries especially during the initial phases of industrialization. Among the countries represented Mozambique has the highest LFPR in 1950 and 1985 and Zambia has the lowest during the corresponding points of time.

Female LFPR are, in general, higher in African countries than their Asian, especially South Asian, counterparts. Female LFPR are lower than that of male LFPR in all countries of the region for both the periods. However, LFPR between men and women are more comparable in the case of Mozambique. Zambia on the other hand has the lowest female LFPR and is nearly one-third of that of Mozambique.

LFPR by levels of education are not available from the ILO statistics which periodically collects and collates data on employment. The World Fertility Survey of the UN conducted in 1986 provides LFPR by levels of education for some of the selected African countries. The survey results show that the LFPR among women aged between 15 and 49 take a 'U' shaped curve. Participation rates are higher among illiterates; they start declining with every increase in the level of education up to secondary level; and the rates are higher among those women who have more than 10 years of education.

Employment

The employed are those who are working and receiving a wage. Work is a broader concept which is more related to the social roles of an individual and it does not necessarily imply a wage i.e. the criterion of 'being paid' cannot be used in the case of work.

ILO categorizes the employed into two:

(i) Those who are in paid employment; and
(ii) those who are engaged in self-employment activities.

Self-employed are those who work for profit or family gain but not receiving a direct wage for their job. The unpaid family workers are treated as self-employed.

The employment pattern can be analyzed either in terms of industrial divisions or occupational categories. In developing countries a very high proportion of the labour force is engaged in primary activities. The share of the primary sector in employment is expected to decline in the process of development. Sometimes the relative share of the labour force between different economic sectors - primary, secondary and tertiary - is considered as giving an idea of the level of development of an economy.

Unemployment

Unemployment, in the economic sense, refers to those who are involuntarily unemployed; i.e. those who are not working but seeking employment at the on-going wage rate. Based on the factors causing unemployment, it is categorized into frictional, structural, cyclical, seasonal, etc. Seasonal unemployment is very common in the agriculture dominated developing countries. Disguised unemployment is one of the important forms in which unemployment is prevalent in many developing countries. It exists if a withdrawal of a part of the labour force from production does not result in a decline in total output. In technical terms, it means marginal productivity of the disguised unemployed is zero.

Nowadays under-employment has become a common phenomenon in many developing countries. With slowing down of the growth of the economy in the recent past, under-employment is slowly but steadily spreading to all sectors of the economy. However, the incidence of under-employment is more among urban educated workers who are in the formal sectors of employment. It is of two types - visible and invisible. The former means working less than the normal hours of work. The latter exists when more people are engaged in an economic activity than would be needed to produce the output which they actually produce.

Labour mobility

Labour mobility implies the movement of labour and can take different forms. The movement of labour from one region to another is referred to as spatial mobility or migration. Migration can be internal (when it is between regions within a country) or international (when it is between different countries). Vertical mobility refers to mobility from a lower employment status to a higher employment status. Horizontal mobility, on the other hand, refers to mobility from one occupation to the other at the same employment status.

Wages

Wage in the economic sense is the reward for the factor of production namely labour. In general it is the payment to the workers and employed persons. The basis for determining wages can be:

(i) payment by time,
(ii) payment by results.

Salary denotes the best example of payment by time. Payment by result relates to the actual work done. Most of the contractual work is based on this concept.

Sometimes a distinction is drawn between wage, earnings and income. Wage is a reward for the work done, earnings include the fringe benefits associated with a job; and income includes earnings and returns from property or wealth.

Real wages have declined during the recent past. A decline in real wages has adversely affected the more educated. Between 1979 and 1986 the real official minimum wages nearly halved in many of the African countries. For example the real wages in Tanzania in 1986 declined to 36 per cent of the real wages in 1980.

2.2. Manpower approach to educational planning

The manpower approach is one of the most commonly used approaches to plan education. This approach argues that provision of supply of adequate manpower with varied skills is the main function of the educational system and therefore education should be planned according to manpower requirements. The projection of demand for different categories of manpower forms the basis of determining enrolments and provision of educational facilities in the schools and colleges.

Methods of manpower estimate

There are various methods to estimate manpower demand. Perhaps the simplest method is to ask each employer about his future requirements of manpower. In micro situations this is applicable. However, for planning at the macro level it is difficult to rely upon this method. Alternatively, sometimes the international comparison method is used to plan education. This method involves observing the occupational and educational structure of a country at a more advanced level of development and hypothesize that this is the desired structure for the country for which the forecast is to be made. Similarly, sometimes the model firms comparison method are used to derive the occupational structure. In this approach the occupational structure of the most modern and efficient firms within a country are considered as the ideal and the occupational structure derived is used to plan education. Incremental Labour Output Ratio (ILOR) and density ratio methods are also used to project manpower. ILOR method extrapolates a particular type of manpower in an occupational category and its corresponding output or national income. The density ratio method consists of estimating stable fractions of qualified manpower in an economic sector and applying these to the total labour force forecasts in various sectors.

The MRP method

The method that was adopted as the method for forecasting manpower in this training programme was the methodology used in the OECD's Mediterranean Regional Project (MRP). This methodology was adopted for two reasons:

(i) this is the most commonly used method for manpower forecasts in many countries; and

(ii) it provides detailed and systematic steps for manpower planning.

MRP methodology involves five main steps in assessing the required number of workers by educational levels in the target year of the plan.

The first step is to estimate the future level of output (GDP) for the target year. This estimated GDP is very often divided by the total population and expressed in terms of GDP per capita. The next step is to estimate the structural transformation of the economy or the distribution of GDP by economic sectors. In general in all the developing countries the share of primary sectors will be very high. But during the process of development the share of the agricultural sector comes down and that of manufacturing and service sectors goes up. Therefore, this change envisaged in each sector is to be estimated and incorporated because such structural changes will have direct implications so far as the nature of labour skills demanded is concerned. Very often the structural changes depend upon the growth rates in each industry which are often predetermined by policy.

The third step is the estimation of labour productivity by economic sector for the targeted year. Measurement of labour productivity itself is subject to controversies. However, for the purpose at hand labour productivity is defined in a very crude form as the sectorial GDP divided by the number of workers in that sector. Estimation of labour productivity for the targeted year will help us in deriving the number of workers required in the target year. The figures for sectorial GDP (step II) have already been estimated. Sectorial GDP divided by the labour productivity in that sector gives the required number of workers in that sector. And their summation across the sectors gives us the total number of workers.

The fourth step involves estimating the occupational structure of the labour force in each of the economic sectors. Generally the international standard classification of occupations is used to categorize the workers into different occupations. The relative position of each occupation may change. Some occupations may attract more qualified workers, while others may remain the same or be reduced.

The fifth step is to estimate the educational structure of the labour force in the given occupations in different economic sectors. This involves estimating educational levels of the workers in each occupational category.

Each occupation will have persons with different levels of education. The proportion of different levels of educated within each occupation is computed. The proportion forms the basis for future projections. Based on the projections of this proportion for the target year, the educational levels of workers in each occupation are estimated. It may be noted that since the total number of workers is already estimated (in step III), this gives the workers by educational levels in all occupations. An aggregation of workers by levels of education across occupations gives the total number of workers by levels of education in each occupational category in each economic activity is the main task of this exercise.

Estimation of manpower supply

Next, an attempt is made to project the number of persons with the required levels of education over time. The projection of manpower supply takes this into account. The expansion of the educational system can either be strictly planned on the basis of required manpower or be a result of spontaneous expansion based on social demand. Very often expansion of the educational system in the developing countries is based on the social demand approach. In this context demographic factors influence and determine enrolments in the primary levels of education, and the pattern of student flow between classes and stages determines the number of graduates produced by the system. The participation rates of graduates of each level give the number of persons actually available for work.

In this manpower model, the projected demand for different categories of manpower forms the basis for projecting the required enrolments at different levels of education. The method of projection of manpower supply in its simplest form is based on student flow rates. Any student entering the educational system can have only three possibilities - either he or she is promoted to the next grade or is a dropout from the school or is a repeater in the same grade. Based on all these three possibilities the flow rate method estimates the number of graduates for any given number of enrolled students with the help of promotion, repetition and dropout rates. Depending upon these three factors one can decide the excess number of students to be enrolled in each level of education to get the projected number of graduates as workers. This also has to be adjusted for the labour force participation rates of graduates of each level of education.

Balancing demand for and supply of manpower is an important step in the manpower planning approach. During periods of shortages, the yearly intake needs to be augmented. Similarly during periods of excess supply the yearly intakes are to be reduced so as to adjust it to the projected demand. The balancing is an interactive process to obtain a scenario with no excess or shortage for the target year. This process can easily be carried out with the help of computers.

An overview of the manpower planning approach

Manpower planning is based on a number of assumptions. These assumptions include those relating to:

(i) economic growth,
(ii) sectorial distribution of the labour force,
(iii) labour productivity, etc.

Many of these assumptions need not be true in the real world situation. Therefore there is a danger of the projected numbers being different from the actual requirements. One way to avoid difficulties in this regard is to provide alternative projection scenarios instead of a single scenario.

Perhaps, the most important assumption in manpower projection is the fixed coefficients of production. There is every possibility that this assumption in the long run may be invalidated, the more so given the pace at which technological changes take place.

Very often the manpower planning approach is criticized for not being able to take into account the informal or non-formal skill formation process existing in the economy. Similarly, the orientation of the model is towards the formal sectors of the economy. In a sense, the macro model takes into account the employer's point of view. The individual employees and their expectations and aspirations are not incorporated in the model. Planning needs to have a human face which implies seeking a balance between economic conditions, social realities and individual expectations and aspirations.

There are different ways in which the macro-model conflict is taken care of especially in socialist countries. They introduce and promote vocational guidance programmes as part of the educational process. These guidance programmes attempt to adjust individual aspirations in accordance with national priorities.

Manpower projection requires information on a large set of factors. Many countries do not have an adequate data base. The development of a Management Information System (MIS) becomes a pre-condition for reliable manpower projections. Many countries in the region are in the process of developing and updating their MIS. The recent efforts in Botswana to develop an Occupational Information System (OIS) illustrate attempts being made in this direction. The OIS of Botswana is, perhaps, very systematic and elaborate and can be of immense help to other countries to develop a similar information system.

Most of the African economies are in a state of financial crisis. Many of them depend on aid provided by different international agencies which compels them to make various adjustments. During conditions of adjustments, planning, in general, becomes a casualty; so also does manpower planning. The role of the educational planner becomes really embarrassing under these circumstances. Often prepared plans are overturned by political decisions resulting from external pressures. Therefore, educational planners have to play rather a cautious role in their bargaining with the policy makers.

In many African countries the relative significance of the informal sector in employment is increasing. This is the sector which needs different types of education and skill orientation. The training programmes have to be need-based and job-specific. Perhaps, a role for manpower planning in a non-traditional sense may emerge for the benefit of these sectors.

Finally, the figures projected by the manpower planners should not be treated as unique solutions. At best they should be taken as broad indicators at the national level. And at the micro-level individual expectations and aspirations are to be given due consideration. The tracer studies method takes into account these individual characteristics.

3. Education, earnings and theories of the labour market

3.1. The earnings function

Individuals differ n the incomes they receive. Research studies from the sixties have shown that education is one of the important variables in explaining earning differentials between individuals. It needs to be noted that there are variables other than education influencing the earnings of an individual.

The relationship between earnings and the influencing variables can be expressed in mathematical form. Such a mathematical expression can be called an earnings function. Empirical analysis of earnings involves various steps - among which specification of the function is very important.

The specification of the function needs identification of relevant variables considered to be influencing earnings. Past studies have shown that earnings of an individual are influenced by variables like level of education, sex, sector of employment, experience/age, occupation etc. Based on the past research evidence one can fit an earnings function as follows:

Earnings = a + b1 (experience/age) + b2 (level of education) + b3 (sex) + b4 (sector of employment) + b5 (type of job) + ...etc.

Using the statistical technique of multiple regression one can ascertain the exact degree of influence exerted by each of the variables listed above on earnings.

Before running a multiple regression equation one may have to make a lot of adjustments and transformations in the data on the one hand, and clearly identify the relevant variables on the other. To identify the relevant variables one may have to resort to a scatter diagram or plotting the curves. At times a correlation matrix involving all the variables considered to be explanatory needs to be constructed. And one has to make adjustments for multicollinearity effects. Multicollinearity exists when independent or explanatory variables are correlated among themselves. One of the most commonly applied methods to avoid multicollinearity effects is to drop any one of the two explanatory variables which are significantly correlated with each other. The correlation analysis will be a helpful method for identifying multicollinearity effects.

Multiple regression analysis will give R^2 values and coefficient of each of the explanatory variables, a constant term and level of significance of each of the coefficients. In our equation the term a' is the constant which denotes the intercept: b1, b2, b3, etc. are the coefficients of the respective explanatory variables. Normally the standard error of estimate of each of the coefficients is given in brackets. R^2 shows the proportion of variation in earnings that can be explained by the specified function.

Normally earnings functions are based on sample survey data. The earnings function based on one of the recent surveys conducted in Botswana on the earnings differentials of the educated found that age, education, training are significant variables explaining earning differentials of individuals. These variables together could explain 46 per cent of the earning differentials.

Theories of the labour market

Analysis of earnings has shown that education influences differentials in earnings. Higher levels of education result in higher earnings. Why do the higher educated earn more than their less educated counterparts?; how can the higher earnings of the educated be justified? The labour market process and the perceptions of the employers regarding their potential employees are important factors contributing to the empirically observed earning differentials. There are different theoretical explanations for earnings differentials between the different levels of the educated.

One of the most commonly held explanations is the human capital theory. According to this theory, education imparts cognitive skills which enhance the productive efficiency of the educated. Since people are paid according to their relative contribution to output the more educated are justified in receiving higher wages. In other words, the productivity adding role of education results in higher earnings.

The screening hypothesis considers that the higher educated are more talented and hence more productive. But these talents are not developed through the educational process. Education only identifies the more talented from the less talented and hence less productive. In other words, the role of education is identification of the more productive from the less productive rather than developing productive skills among individuals. In this sense, education screens or filters individuals and helps in allocating them to appropriate jobs.

The socialisation theory postulates that education results in social reproduction. The teaching and grading system in the schools have structural correspondence with the way production is organized in a capitalist society. The educational system inculcates affective traits through its socialization role. These affective traits are highly valued by the employers and hence the employers are willing to pay a high salary to those who are more educated.

The job competition model presumes that productivity is a feature of jobs rather than of individuals. Individuals compete more for jobs than for wages. When there is unemployment there will be a labour queue in the market. The employers know very well that they have to impart training to their potential employees for effective job performance. Hence they are looking for individuals whose training costs will be the least. In the absence of relevant information the employers have no way of knowing the training costs of different individuals. However, employers from their past experience know that those who are more educated pick up skills faster. Therefore, they use education as an important background characteristic in recruitment. In short, trainability becomes one of the most important characteristics that the employers are seeking in the labour market. Since trainability is usually positively associated with levels of education, the employers are ready to hire the more educated and pay them accordingly.

In certain cases, employers follow a preferential hiring practice based on educational qualifications. When there is widespread unemployment, those with higher qualifications seek lower paid jobs. Employers in their recruitment policy give preference to those who are more qualified. This results in 'bumping out' the lower level educated from their respective job categories and eventually leads to the bumping out of the less educated from the labour market itself.

There is also the view that labour markets are segmented into primary and secondary sectors. Primary labour markets are characterized by high wages, stability of employment and promotion possibilities. The secondary labour markets are characterized by low income, poor working conditions, instability of employment and high labour turnover. Recruitment to the primary sector is based on educational qualifications. There is a positive association between socio-economic background and levels of education. Hence while opting for qualification based recruitment to high paying jobs, the employers are also choosing people from a better socio-economic background. In other words, social origins become an important factor in education and recruitment. And education very often serves the employer's purpose and hence they use it as a justification for divisive measures.

Each of these theories represents part of the reality. In the real empirical situation, it is very often difficult to categorize the labour market into any one category. Categorization depends more on the ideological orientation, the techniques used and the variables included in the analysis.

3.3 Tracer studies

The inter-dependence between educational development and the over-all socio-economic development of a country calls for an analysis of resource potential in natural, physical and human categories. The exploitation of natural resources depends on the development of human resources and vice-versa. Human resource potential is influenced by demographic changes. Education plays a significant role in developing human resources. Therefore, there is a need to plan education to develop human resources. Educational achievement of individuals is influenced by the conditions of employment or unemployment, the recruitment and promotion policy. That is to say the development of human resources is dependent on the operation of the labour market and the prevailing employment policy.

At the micro-level an analysis of the relationship between education and employment has to take into account the background characteristics, attitudes and expectations of individual human beings. The economy and society and to some extent education influences the behaviour, attitudes, preferences and expectations of the individual. The important micro characteristics on which one needs information are:

(a) individual characteristics like age, sex, marital status, etc.
(b) Family characteristics like family size, education, occupation etc.
(c) Community characteristics like caste, religion, urban, rural etc.
(d) Early educational characteristics like type of school, academic performance, type of education etc.

The educational career of an individual is directly influenced by educational expectations. The family background and future expectations decide the institutions in which one is to study, field of study pursued, academic performance etc. The occupational career of an individual, on the other hand depends on educational career, labour market situation, occupational expectations etc. The career information received, placement services used, recruitment method adopted, type of post held etc. are important factors in occupational career.

The basic thrust of this approach, is that the education system can change the characteristics of the individuals, families and the community so as to make the transition from institutions of education to work smooth. This method involves tracing back the history of each individual from his present position with respect to all the micro-characteristics detailed above. In some cases, tracer studies are also undertaken by following a cohort of students, eliciting information on their positions at fixed intervals, say at five years over a period of time. In both cases one is tracing - whether forward or backward - the important socio-economic characteristics of an individual.

As can be seen this method involves a lot of data collection o various aspects. So far as macro information is concerned, data can be collected from secondary sources. For micro characteristics, data are to be collected from the primary sources. Generally in tracer studies, samples are drawn from students, graduates, employees, unemployed, employers, etc. and a detailed questionnaire is used to collect data on micro-characteristics.

Tracer studies can be of two types:

(i) employees are identified and they are traced back regarding their various characteristics pertaining to individual, family, community, recruitment practices etc. Most of the IIEP studies belong to this category.
(ii) Some of the recent tracer studies in Botswana use school leavers as the beginning point. In such cases, the individuals are followed up after a certain period. Such attempts can be termed as follow-up tracer studies.

4. Strategies for a better match between learning and work

These strategies were discussed separately for the formal, non-formal and informal sectors of the economy and the education system.

4.1 The formal sector

In market economies, to achieve improved equality of incomes, an egalitarian educational system is proposed while to improve the economic well-being of the population, the skill formation function of education has been emphasized. Sometimes the two goals may be conflicting and an optimization mechanism is called for. In capitalist countries, schooling has tended to serve working class interests thanks to the power of the labour unions. However, recent problems of unemployment facing these countries have generated occupational information systems, and have contributed to developing effective career guidance, counselling, training and retraining facilities. Education-industry liaison has also been promoted. In centrally planned economies guaranteed employment makes the relationship between education and employment apparently simpler. In reality, however, under-employment has been a chronic problem. Recently they are developing strategies to promote individual initiatives inherent in the human capital model of market economies. Some developing countries like India are exploring the possibility of 'delinking' education from jobs. For the formal self-employment sector, it is suggested that educational systems should develop content, structure and methods of instruction so as to instill characteristics conducive to self employment. It is also suggested that governments may provide credit facilities to young people for self-employment.

4.2 The informal sector

Due to (i) the recent economic crisis weakening the state sector in generating employment, (ii) structural adjustment programmes leading to retrenchment in the formal sector, (iii) decline in real wages, (iv) increase in insecurity and instability of employment in the formal sector, and (v) rapid expansion of the education system leading to unemployment of educated youth, most of the countries of the African region are noticing that the informal sectors of their economies are expanding. Governments are thus also regarding the sector as an avenue for employment generation and education systems are being called on to play a role in promoting this development. The following strategies have been utilized or proposed:

(a) Literacy campaigns, radio/newspaper information campaigns regarding existing legislation on work and wage regulations, financial assistance etc.
(b) Organization of cooperatives and training in co-operative movements.
(c) Tailor-made vocational and management training.
(d) Evening classes for entrepreneurs in specific fields.

4.3 Education and productive work: the non-formal sector

Colonialism has distorted the natural development of the native technological capabilities and learning systems. During the colonial period, formal education was structured in line with the hierarchy in the production process. This structural correspondence between organization of production and education changed the role of education more towards a social selection process. In this process education was divorced from its natural environment in terms of curriculum content and value orientation. Recently there is a trend bringing education towards its natural socio-cultural environment. Initiatives in the realm of education and productive work needs to be seen in this light.

Education with Production (EWP) is an attempt to make productive work an integral part of programme of general education i.e. integration of production into the curriculum of primary and secondary schools. EWP considers the involvement of all pupils in production as central to the learning process. It attempts to acquaint students with relevant practical skills on the one hand and to develop an interest in an respect for manual work to instil desirable social values on the other. It will also help the schools in generating necessary financial resources through production.

Unlike vocational education, EWP is not meant to train students in job-specific skills. EWP has been strongly influenced by attempts by governments to link education to production through polytechnic education, a shift in emphasis of production practice from places of work to farms and workshops within school and vocationalization efforts.

The basic education of India, and education for self-reliance of Tanzania are attempts in this direction. In Zambia, Mozambique and Zimbabwe too similar attempts are being made. Perhaps, the Brigade Movement of Botswana is the most successful experiment in the area of linking education with productive work.

4.4 Some examples from SADCC countries

There are various examples of efforts initiated by many governments to link education with work. The beginning of National Apprenticeship Programme in Nigeria where secondary school students are attached to industrial units for the purpose of training is a good example. The government of Zimbabwe has reformulated its policy on vocationalization of education in an effort to establish closer links between skill formation and employment opportunities. The 'Jua Kali' movement of Kenya is yet another example of seeking solutions to the problem of unemployment through a policy of skill formation.

Recent efforts in Zambia provide a further example. Zambia had a policy of state guaranteed employment which continued until 1974. But the government could no longer afford such a policy. Output from the education system continued to expand thus paving the way for further accentuation of the already grave problem of unemployment. As a solution, the government of Zambia in collaboration with UNDP initiated a test project called SELP (Employment Project for School Leavers). The major objectives of the project are to sensitize the school leavers regarding self-employment avenues by promoting entrepreneurial skills on the one hand and assisting them with bank loans to initiate self-employment activities on the other. This programme started in 1988 with an intake of 400 school leavers. Depending on the success/failure of the programme, it will be spread to other regions.

SHAPE (Self-Help Action Plan for Education) in Zambia is another attempt to link education with work. The main purpose of this programme is to enhance the capacity of schools and colleges for self-help in professional material terms. It assists the various initiatives of teachers and administrators to improve the quality of education through mobilization of local resources and to organize a variety of self-directed activities. SHAPE brings together school production and resource mobilization. One of the immediate visible advantages of this programme is in reducing the financial burden on parents of school attending children.

The Brigade movement in Botswana takes after the "The Works Brigades" of Ghana with the primary objective to overcome certain shortcomings of the formal educational system. This movement began in 1965. The objectives of the programme are:

(a) to provide vocational training to primary school leavers outside the formal system;
(b) to combine training and productive work so that the brigades will be able to establish self-employment units or to find employment with other agencies.

These brigades function in close co-operation with the community. It is mainly a three year programme leading to a trade test in the specified area of training.

The government supports this movement by:
(i) providing funds for certain categories of capital projects;
(ii) subsidizing training costs of certain Brigades;
(iii) providing upgrading courses for Brigade staff.

At present there are a number of brigades operating in different parts of the country. People are enthusiastic to join the brigades since it almost guarantees a job for the person.

The Malawi Yung Pioneers (MYP) Programme attempts to:

(a) provide training for jobs;
(b) prepare for military service;
(c) inculcate discipline.

The age-group of the trainees is in general eighteen years and above. The intake is 2,400 trainees every year. There are 24 training bases. Those who are selected are given a leadership course which includes Malawi history, crafts and agriculture. After the completion of the course the trainees are expected to go back to the rural areas and spearhead agricultural changes. This programme is one of the successful self-employment programmes for skills.

Education for Self-reliance (ESR) of Tanzania is yet another example of bringing back education to its natural and social environment. It focuses on the integration of education and production. It aims at changing work attitudes and related values in students and teachers, the acquisition of work enhancing knowledge and skills by students and mutually enriching school community relationships. Curriculum reform was an important aspect of ESR. Apart from that, efforts were made to provide school children and students with practical skills and knowledge which would make them more useful and self-reliant. The practical skills imparted at the primary level include skills in arts and crafts, home economics and agriculture. In the two-year post-primary programme, introduced in 1977, students are taught skills in agriculture, home economics and bookkeeping. The secondary school curriculum is diversified into: (i) commerce, (ii) agriculture, (iii) home economics. Implementation of the programme had many difficulties and achievements are, perhaps, less than expected. However, the country is hopeful of accomplishing its goals in the years to come.

Some policy options

We have seen various examples of efforts to link education and work in many countries of the region. These examples highlight some of the possible policy measures with respect to re-orientation of education and training activities to link them better with work. Possible policy options are:

(i) Introducing productive activities as part of the existing school system.
(ii) Providing training as part of the existing schooling system.
(iii) Introduction of vocationalization programmes.
   Vocationalization can be of various types:
   (a) vocationalization for work orientation;
   (b) vocationalization for imparting training so as to enable students to directly enter the productive labour force.
(iv) Providing training separately before job entry.
(v) Providing on the job training.

Perhaps these options are not mutually exclusive. The governments may choose any one or a combination of these options depending upon its own specific situation.

4.5 Gender issues in learning and work

Empirical evidence throughout the world shows that women are under-represented both in the school system and employment market. The relative significance of this gender imbalance increases with each stage of education and level of employment. In other words, gender differences are less at the primary level than at secondary and post-secondary levels of education. Similarly, gender differences are less pronounced in low paying jobs than in high paying jobs. Though this is a general trend it needs to be noted that in case of Botswana, there is a better gender balance both in education and employment at all levels.

Why are women under-represented in education and employment around the world? Part of the explanation lies in the socio-cultural factors which inhibit girls going to school which eventually creates barriers to entry to high paying jobs, and part of the explanation can be sought in the economic forces reflected through patriarchy and capitalism which attempt to reinforce the dominance of men over women. Advances in technology and industrialization within the capitalist mode of production have contributed to the declining economic role of women. The feminist movement in many of these countries did succeed in pressurizing the ruling classes to legislate measures to facilitate higher participation of women in economically productive activities.

One of the significant features of post-world War II developments is the increasing labour force participation of women in all the industrialized countries. This increased participation is primarily due to the increased participation of married women in the labour force consequent upon:

(i) a decrease in fertility rates; and
(ii) an increase in divorce rates.

In developing countries the labour force participation rates of women, in general, are low. However, among the developing nations, African countries have higher labour force participation rates among women.

Discrimination against women in the labour market can be manifested in two forms:

(i) wage discrimination; and
(ii) job segregation.

Various legislative measures resulting from social and political pressures have helped in reducing wage discrimination. However, job segregation continues. Women are increasingly segregated to traditional and low paying jobs. This is sometimes referred to as 'feminisation' of jobs or 'marginalisation' of the economic role of women.

The Brigade movement in Botswana reflects under-representation of women in general and concentration of women in traditional vocations in particular. But efforts have been made in Botswana to correct this imbalance through propaganda, direct contacts, etc. Consequently, women's share of the intake in Brigades has increased from 6.5 per cent in 1986 to 14 per cent in 1989. Efforts are also being made to increase accessibility of women to non-traditional trades. Some countries in the African region notably Zimbabwe and Tanzania have attempted to introduce a quota system to reach a better gender balance.

Though gender imbalance cannot be totally corrected through the educational system, it has an important role to play in this direction. Since education and training systems are primary agents of segregation, changes in their orientation can bring about reasonable changes in the existing pattern.

The policy options in this regard may be as follows:

(a) introducing necessary changes in the organizational and curriculum structure of institutions to make programmes more accessible to women and improve their performance;
(b) Upgrading skill levels in the traditional work activities of women;
(c) increasing access to work activities currently dominated by women;
(d) increasing access to new areas of work activities which are now dominated by men.

Chapter 2
Education and employment in Africa: an overview
by B.C. Sanyal

1. The historical context

The relationship between education and employment as an essential element of human resource development has evolved over time in Africa as in other continents of the world.

Most African countries' economies were essentially subsistence agrarian before the advent of the western commercial and industrial civilization. The primary task of the community was to produce food, the most important basic need. All ancillary crafts and occupations supported this primary function and services necessary for subsistence were provided by different social groups. The socialization of the individual, his training in a given skill and in the value system of the society, were all indivisible elements of a single learning system. The family, the workplace, the formal centres of learning, and the religious institutions, all imparted education on how to live, work and follow the rules of the society into which an individual was born. The social leaders, the elders, expert craftsmen and religious teachers set the standards and provided the learning. The world of work could hardly be separated from the world of education.

Even during the period when many of the developing countries were under colonial domination, the same system prevailed in most of these countries, particularly in the rural areas where most people lived and which remained unaffected by the western civilization brought by the foreign rulers. However, in the urban areas and in the tiny modern sector of the economy, namely the government and commercial sector, the colonial rulers needed local manpower at the subordinate level, whom they trained in institutions set up according to their own needs. The formal education system which was producing these cadres was elitist, and generally the language of instruction was that of the foreign colonial rulers. Education was restricted in quantity and type to meet the needs of the rulers.

At the same time, the modern organized sector started recognizing the completion of an educational programme as a requirement for employment, graded, perhaps arbitrarily according to the type and duration of studies. Education and employment now had a correspondence, but the inherent linkage was lost; the world of education became separate from the world of work.

At independence, many of these countries had to expand their educational systems. Developmental efforts and departure of expatriates holding high-level decision-making positions created a heavy demand for education in quantitative terms. In addition, accelerating scientific and technological development, the internationalization of the means of production, the division of labour and of knowledge have among other factors, led almost all countries of Africa, to critically examine their systems of education to ascertain whether they are meeting the challenges of the time. The best way education can serve society to-day is to prepare people capable of tackling the emerging problems that beset their particular society. These problems are moral and ethical on the one hand and materialistic on the other, related to the basic necessities of life, namely food and nutrition, health and sanitation, housing and shelter.

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These basic needs can only be satisfied to-day through economic activity, and the education system is required to provide the necessary skills in order that these basic needs may be supplied. In a static, subsistence economy, education may only need to bother about mind and character; in an information, industrial and commercial economy, it has to cater for 'matter' as well. Clearly, education to-day cannot justify its existence by providing only academic learning for mental or spiritual development; it has to convey the necessary skills for economic development in addition to cultural and social development, in order that natural resources might be explored and exploited, products stored and distributed, services managed, and resources conserved for future generations. Such skills would not only enable solutions to be found to present problems but also prepare young people to work on the unpredictable, complex and dynamic problems of the future. Some characteristics of this expansion are given in the following section.

2. A brief note on educational expansion

We will restrict our note to the countries which are represented in this course. We take liberty also in fixing the period of reference. For the development of education, because of availability of data, we will consider 1975 to 1986 to be the period. In some cases, however, the period and year of reference will vary again due to data constraints. Before 1975 the growth of education was, in general, faster than that of 1975-1986 because of a lower base. The data are given in Table 1 for all the countries present in the course.

One may observe from Table 1 that in the majority of the countries the higher the level of education, the higher is the growth rate in enrolment. In Mozambique enrolment in first level remained almost stagnant during the period 1975-86. In spite of a very high growth rate total enrolment in higher education as a share of the total population in the relevant age group (20-24) remained desparately low in most of the countries. While the world average is 12.8 per cent the highest is only 3.9 in Swaziland and Zimbabwe. Lesotho, Botswana, Swaziland and Kenya have enjoyed the highest growth rates ranging from 17.6 per cent in Lesotho to 11.0 per cent in Kenya, whereas the other countries have low growth rates ranging from 7.1 per cent in Zimbabwe to 0.4 per cent in Zambia. The faster growth in higher education is not only due to economic needs for skills but also due to socio-political pressure. The growth rate for all the countries was even faster in the earlier period. Due to economic and social reasons in some countries it slowed down during the period 1975-86.

There is a hidden characteristic of the growth in higher education in these countries. When one analyses the growth by disciplines, it is noted that in most cases the growth rate has been faster in the arts-based disciplines than in the science-based ones. Lesotho, Botswana, Swaziland and Uganda suffer in descending order from this imbalance more than the others. It is interesting to note that Mozambique with a very small third level enrolment has the highest proportion of science based students.

The reason for expansion in arts-based disciplines is principally economic — these disciplines being less costly. The growth in enrolment resulted in an increased number of graduates from secondary and higher education every year. To what extent the economy of the different countries grew so as to be able to absorb the increased number of educated youth in the employment market is discussed in the next section.

Table 1: Average annual growth rate of enrolment during 1975-86 and gross enrolment ratio in 1986 in selected countries of Africa for different levels of education

	First level		Second level		Third level	
Country	Growth rate (p.c.)	G.E.R. (p.c.)	Growth rate (p.c.)	G.E.R. (p.c.)	Growth rate (p.c.)	G.E.R. (p.c.)
Botswana	6.7	105	9.7	31	14.2	2.0
Kenya	(a)5.0	94	(a)6.6	20	(g)11.0	1.3
Lesotho	(a)3.5	115	(a)7.7	22	(h)17.6	1.8
Malawi	(a)3.9	64	(a)5.5	46	(a)6.0	0.7
Mozambique	(2)0.0	82	(b)3.2	7	(i)5.3	0.1
Swaziland	(c)4.5	110	(c)6.0	43	(j)13.1	3.9
Uganda	(d)7.5	n.a	(d)14.9	n.a	(a)6.3	0.8
Tanzania	6.4	69	4.8	3	4.5	0.3
Zambia	4.1	104	(e)6.1	n.a	(h)0.4	1.5
Zimbabwe	9.2	129	(f)20.5	46	7.1	39

Note: (a) refers to the period: 1975-85; (b) 1976-86; (c) 1975-87; (d)1975-82; (e) only general second level for the period 1975-85; (f) only general second level for 1975-86; (g) 1980-85; (h) 1975-84; (i) 1976-85; (j) 1975-80. All other periods are 1975-86. n.a= not available; G.E.R. for third level refers to 1986 except for Lesotho (1984) Mozambique (1985) and Kenya (1985).

Gross enrolment ratios are obtained by expressing total enrolment in a level as percentage of total population in the relevant age group. Due to inclusion of over-aged and under-aged individuals in each level enrolment the figures are biased upwards and those for first level may exceed 100 per cent.

Source: Unesco, Statistical Yearbook, 1988, Unesco, Paris 1988.

3. The economic situation of the selected countries

Table 2 shows a very pessimistic picture of the economic situation. All the countries except Botswana had a lower growth rate in production in the formal sector of the economy than the growth rate in population during the period 1980-86. Thus the economic situation deteriorated in these countries in terms of GNP per capita. Some of the countries had a net decrease in production e.g. Mozambique and Zambia. When one looks into the growth by economic sector, services have been able to maintain a positive growth (except for Zambia) even with negative overall economic growth. One should also note that Botswana registered the highest growth rate in the economy during the period 1980-86 among all the countries reporting to the World Bank.

Table 2: Some basic economic indicators of the selected countries in Africa

	Population (millions)	GNP per capita (US$)	GDP growth rates (percentage 1980-86)			
Country	mid-1986	(1986)	Total	Agriculture	Industry	Services
Botswana	1.1	840	11.9	-9.8	19.1	7.6
Kenya	21.2	300	3.4	2.8	2.7	4.2
Lesotho	1.6	370	0.9	1.6	-3.9	2.7
Malawi	7.4	160	2.4	2.5	1.5	2.8
Mozambique	14.2	210	-9.0	-15.9	-13.3	0.2
Swaziland(a)	0.7	680	4.0	6.5	3.9	2.5
Uganda	15.2	230	0.7	-0.1	0.9	3.3
Tanzania	23.0	250	0.9	0.8	-4.5	2.9
Zambia	6.9	300	-0.1	2.8	-0.7	-0.5
Zimbabwe	8.7	620	2.6	3.4	0.8	3.7

(a) Figures are approximate and refer to the period 1977-83. Population and GNP per capita is estimated for 1983.

Source: World Bank: World Development Report, 1988 World Bank, Washington D.C., 1988

Botswana's economic boom has created shortage of educated manpower in almost all disciplines. However the precarious situation of the economy prevailing in the other countries in the face of an expanded education system has created serious problems of unemployment and underemployment. Certain countries like Lesotho, Swaziland and Uganda suffer on the one hand from unemployment of some kinds of educated youth especially these educated in liberal arts and from scarcity of educated manpower in science and vocation oriented disciplines on the other.

A large sum of money has been invested in educating these citizens which could otherwise have been invested in job creating productive programmes. It is not only the economic aspect which makes this problem so grave. The social and political stakes are also very high. While the problem of shortage of educated manpower has been tackled reasonably well by various means as we shall see during the seminar the problem of surplus of educated manpower resulting in unemployment and underemployment is not amenable to any easy solution. We shall discuss the different aspects of the problem of unemployment in the following section.

4. The characteristics of the problem of educated unemployment

One can make an important distinction between two different aspects of unemployment: incidence and duration. Unemployment incidence is the percentage of unemployed in a given population group. It is the 'unemployment rate'. On the other hand, unemployment duration has a calendar time attached to it. It usually takes the form of 'absorption rates X years after graduation', or, simply, mean years or months unemployed since graduation. Research carried out at the International Institute for Educational Planning (IIEP) of Unesco and other research studies demonstrate some relationship between unemployment incidence and the level of education. In many cases, the relationship takes the form of an inverted U-shape, meaning that it is the graduates of the middle-level education who are most hit by the unemployment problem (Psacharopoulos and Sanyal 1981). However, there are exceptional cases. For example in Kenya the unemployment rate of higher level graduates is lower than that of lower level school leavers. (Blaug 1973, p.9). Similar is the case of Botswana (Kann et al., 1988). The inverse relation between unemployment and educational attainment supports the theory of labour queue, according to which education is a critical background characteristic used by employers in ranking potential workers on the basis of their training costs. Behind the increased social demand for higher education there is also this reasoning.

In respect of duration of educated unemployment, it appears that it is a sharply declining function of age, i.e. it is principally a youth problem, nearly every graduate finding a job after some time. For example, according to a survey conducted by IIEP in 1975 in Zambia, over 90 per cent of graduates were employed within the first month after graduation. Waiting period to find the first job varies from discipline to discipline and by sex within the same country as noted in the case of Zambia (Sanyal et al., 1976).

However the phenomenon of open unemployment only reveals a fragment of reality: it conceals the enormous amount of underemployment in non-voluntary part-time and in the under-utilization of skills and capabilities. The ILO has categorized two types of underemployment: visible underemployment , involving shorter than normal periods of work, and invisible underemployment which is characteristic of persons whose earnings are abnormally low, whose jobs do not permit full use of their capacities or skills, (qualification escalation), or who are employed in establishments or economic units where productivity is abnormally low, for example, the vast informal sector prevalent in all African countries.

In most African countries, underemployment of the educated is a more serious problem than their open unemployment. The problem becomes more acute for rural and female educated.

In countries where the educated are guaranteed employment, there is no open unemployment; however, underemployment is a common phenomenon, particularly of the invisible type. Such a situation is to be found in Tanzania, Kenya and Mozambique even though these countries have an abnormally low proportion of educated youth.

Both the issues of employment of educated youth and of the role of education in providing skills for economic and social development have motivated researchers in the field of economics and education to look for means of achieving a better relationship between education and employment.

As is to be expected, they differ in both their points of view and the nature of the techniques of educational planning they advocate. These are discussed below.

5. Education-employment relationship for human resource development

One view is that education provides people with skills to develop and manage the economy and the related services and to negotiate the terms of international co-operation in those areas. It follows, say the holders of this position, that investment in education is an investment in human capital, and consequently in the productive and negotiating capacity of the people. This is the ♦human capital theory. Another view is that education not only provides skills for performing different vocational tasks, but also demonstrates social values in promoting upward mobility in society, and that education acts as a screening device to select the ablest people for the best jobs.

Yet another point of view takes a historical and general approach to the development of societies. It denies the existence of a single labour market. In a world where people are obliged to find work in order to survive, it is the owners of the means of production who determine the main characteristics of the labour markets. They thereby foster the ♦segmentation of labour markets between different types of employers and different types of jobs (Sanyal, 1987).

Each of the above viewpoints has different implications for educational policy. None of them applies in its entirety to any one country. For example, while most people acknowledge that some ♦segmentation prevails between the modern and the traditional sectors or between public enterprises, multinationals and the rest of the national private sector, and between male and female types of workers, it is nevertheless the case that mobility between segments, and the role of education in this mobility, is greater than ♦segmentation theorists generally admit.

The above points of view in respect of the relationship between education and employment have contributed to the evolution of techniques of educational planning. Some aspects of this evolution will be treated in this training course, the details of which are given in the following sections.

6. Objectives of the course and the participants

Improvements have been made in techniques of manpower forecasting but there is a general admission of their limits even in centrally planned economies. We are on the way towards a paradigm shift in the field of manpower planning. The diploma disease is widespread. We have to look for both curative and preventive measures. This calls for a wider approach than has been applied so far. We have to look at needs for manpower of course, but also at needs for jobs/work. We need to discuss the role of the informal sector; is it possible to plan for it; what can the school do in this context? Another important aspect is the use of labour intensive approaches by the government and the private sector. Who is responsible for monitoring implementation of educational plans based on manpower forecasts? Is it possible to stem social demand for higher education by wage policies or other measures? In order to explore these complex inter-relationships for the SADCC countries, the International Institute for Educational Planning of Unesco in consultation with Unesco's Regional Office in Dakar approached the University of Botswana to co-operate in organizing this Intensive Training Seminar. Although the original target group was the SADCC countries, we extended the invitation to some other adjacent countries which expressed urgent need for such type of courses. The countries are Kenya and Uganda. Angola a member of the SADCC group has not been able to send any participant for this programme. We are pleased to note that the African National Congress and SWAPO having observer status in SADCC have also sent participants to this programme. The participants of the course are planners responsible for decision oriented activities in Ministries of Education, Planning and/or Labour or researchers at Universities and at Planning Commissions or persons responsible for training educational planners at national or regional level. The pre-occupation of the countries and the participants reconciled with the above objectives led us to the design of the content as discussed below.

7. The content of the course

The course will have three main components each having implications for educational planning to develop human resources. These are:

(a) Techniques of manpower forecasts and their evolution

(b) Analysis of factors of social demand and labour market operation and

(c) Exploration and analysis of methods of implementing alternative strategies to achieve a better relationship between education and employment for human resource development.

Each of these components are discussed below.

7.1 Techniques of manpower forecasts and their evolution:

In the discussion of this technique, highlighted by concrete examples, the following questions will be asked: What are the variables and parameters that are considered in forecasting the demand for manpower for different economic sectors? How is the uncertainty in the economic situation accounted for in these forecasts? How is the development of technology accounted for? In what way has the manpower forecasting technique evolved over time in a given country where this technique has been practised over a long period of time? How are educational plans formulated and implemented? What are the difficulties in achieving the balance between demand and supply?

7.2 Factors of social demand and labour market operation

Mere forecast of inputs into, and outputs from the educational system does not ensure the actual availability of educational opportunities to all citizens. Nor does the forecast of manpower demand ensure the insertion of school leavers in the labour market. On the one hand socio-economic status of individuals (age, sex, home background, parental education, occupation and income status etc., along with early educational characteristics) play a decisive role in determining the transition from home to school and from school to work. On the other hand, the type of technology the enterprises use, the way they organize work and establish their employment structures, as well as the manner in which they recruit their personnel play just as important a role. It has often been observed that education is not the only — nor even the most important — criterion applied by recruiting firms.

Questions then arise: what determines demand for education in general and in specific types and disciplines? What role does career guidance play in the choice of a stream and a career? What is the nature and extent of shortages of educated manpower of specific types and disciplines? What is the incidence and duration of unemployment of the educated by level and type of education? What criteria do the employers apply for recruiting a school leaver? What is the relative importance of the cognitive, ascriptive and behavioural aptitudes as criteria for recruitment? What factors determine horizontal and vertical mobility of the workers? What factors ensure utilization of qualifications? What role does education play in the transition from school to work and on mobility (horizontal and vertical) in working life? What role can the techniques of educational planning play in making the transition from home to school and from school to work easier in spite of the limited role of the education system in society?

To answer these questions surveys have been conducted on students, employers and employees which are analyzed in the light of the general socio-economic context of the country concerned. One or two concrete case studies will be discussed after the presentation of the rationale of the surveys and their potential role in educational planning.

7.3 Alternative strategies for a better relationship between education and employment:

Different forms of delivery systems of education are being tried out to reduce the gap between the world of education and the world of work, including the informal sector of the economy, which have so far been neglected and which dominate the economy of the countries represented. Planning techniques for such alternative structures must be applicable to and consistent with the national development strategy. It is with such a relevance criterion in view that a few of these new structures and delivery systems will be discussed.

They will be selected from country cases where there are a variety of work-related programmes in education and productive work, vocational education, education/training programmes for informal sector workers, employment-oriented diversification of post-secondary and secondary education. Given the nature of the economy of the countries analysis of the role of education in the informal sector will be given special emphasis.

8. The organization of the course

The above techniques and strategies will be dealt with in plenary group sessions, practical exercises and field trips, where the participants in the course will be joined by one or two staff discussion leaders. Both the staff and trainees have prepared background notes based on their own experience and perception to be used for the course. At the end of the course, a written report will be published for interested readers and of course for the sponsors and organizers of this course.

9. Acknowledgement

On behalf of the organizers of the course and my own personal behalf I would like to thank all those who have contributed to its financing. I would like to thank the Minister of Education, Republic of Botswana for opening this course. Thanks are also due to the resource persons who in spite of their regular busy schedule have offered to assist us in this venture. We hope this course will be of use to the planners and decision-makers of the participating countries.

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Chapter 3

Diagnosis of the employment situation: some basic concepts

by N.V. Varghese

Introduction

The attempt in this note is to introduce the participants to some of the basic and elementary concepts useful in diagnosing education and employment situation in a country. The concepts discussed in this note are classified under different headings. Section 2 introduces the concepts of GNP and GDP. Section 3 introduces the concept of labour force and work force. Section 4 deals with the concepts of employment and work. It also deals with industrial and occupational classification of employment. Section 5 elaborates on the concept of unemployment. Section 6 deals with labour market. Section 7 introduces the concept of wage. Section 8 deals with labour mobility.

2. GNP and GDP

Gross National Product (GNP) measures the total domestic and foreign output of residents and is calculated without making deductions for depreciation. It comprises gross domestic product adjusted by net factor income from abroad, i.e., the income residents receive from abroad for factor services (labour and capital) less similar payments made to non-residents who contributed to the domestic economy (World Bank: 1988).

GNP per capita is arrived at by dividing gross national product by population of the country. For purposes of international comparisons the World Bank converts GNP to US dollars. This procedure of conversion generally uses a three year average of the official exchange rate.

Gross Domestic Product (GDP) measures the total final output of goods and services produced by an economy—that is, by residents and non-residents—regardless of the allocation to domestic and foreign residents. It is calculated without making deductions for depreciation (World Bank: 1988).

GDP by industrial origin is measured at producer prices or at purchaser values. GDP at producer prices is equal to GDP at purchaser values less import duties. GDP at producer prices is referred to as GDP at factor cost and GDP at purchaser values is referred to as GDP at market prices.

The economy is broadly divided into three sectors—agriculture, industry and services. These three sectors are sometimes referred to as Primary, Secondary and Tertiary Sectors. The Agricultural Sector comprises agriculture, forestry, hunting and fishing, Industry comprises mining, manufacturing, construction, electricity, gas and water. All

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[1] I am grateful to Bikas C. Sanyal for his comments and suggestions on an earlier version of this paper.

other branches of economic activity are categorized as Services. The share in GDP of each of these three sectors is taken as an index of level of development of the economy. With advances in economic development, the share of agriculture in GDP comes down and correspondingly the shares of other sectors increase.

3. Labour force

The total population of a country can be divided into those who are economically active and those who are not. Economically active means all persons who furnish the potential supply of labour for production of economic goods and services (ILO: 1988). The labour force comprises all economically active persons aged ten and above. It includes the number of persons employed and unemployed but excludes the economically inactive population. Two measures of economically active population are: (i) usually active population measured in relation to a long reference period such as a year; (ii) currently active population measured in relation to a short reference period such as one day or one week (ILO: 1988).

International classification by status categorizes the economically active population under the following headings (ILO: 1988):

(a) Employer: a person who operates his or her own economic enterprise or engages independently in a profession or trade and hires one or more employees.

(b) Own account worker: a person who operates his or her own economic enterprise or engages independently in a profession or trade and hires no employees.

(c) Employee: a person who works for a public or private employer and receives remuneration in wages, salary, commission, tips, piece-rates or pay in kind.

(d) Unpaid family worker: a person who works a specified minimum amount of time (at least one-third of normal working hours) without pay, in economic enterprises operated by a related person living in the same household.

(e) Member of Producer"s co-operative: a person who is an active member of producers" co-operatives regardless of the industry in which it is established.

(f) Persons not classifiable by status: Experienced workers with status unknown or inadequately described and unemployed persons not previously employed.

The data on economically active population do not include students, women occupied solely in domestic duties, retired persons, persons living entirely on their own means and persons wholly dependent upon others.

Labour Force Participation Rate (LFPR) is the percentage of total labour force to the total population aged ten and above i.e. total number of persons employed plus unemployed divided by total population aged ten and above multiplied by a hundred.[2]

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[2] It may be noted that working age population refers to population between the age-groups of 15 and 64 (World Bank: 1987).

The labour force is to be distinguished from workers and work force. Workers denote those who are participating in any economically productive activity. This participation can be physical or mental, direct or indirect involvement (supervision etc.) in work. The sum total of the workers constitutes the work force. Work force participation rate is the percentage of workers to the relevant age group population (ten years and above).

Sometimes a distinction is drawn between labour force, work force and supply of labour. As mentioned earlier, the labour force includes employed and unemployed persons; work force includes only employed, i.e. labour force minus unemployed gives the work force. Supply of labour on the other hand includes hours worked and intensity of working effort (Uthoff and Pernia: 1986).

Historical behaviour of labour force participation rates exhibits certain discernable patterns (Uthoff and Pernia: 1986).

(a) LFPR of men and women below the age of 25 tend to decline over a period of time as a result of access to higher education;

(b) LFPR of men and women above sixty decline because of old age benefits and social security system;

(c) Male LFPR between 25 and 55 years of age show only a marginal declining trend.

(d) Female LFPR vary between geographical areas depending upon cultural traditions and agricultural structure. Women are mainly engaged in primary sector activities. Female LFPR is sensitive to total income of the family.

4. Employment

The employed comprise all persons above a specified age who are in paid employment and self employment. Paid employment means working for wage or salary.

Employment and work are sometimes used interchangeably. However, a distinction needs to be drawn between the two. Perhaps, wage is the criterion by which these two can be distinguished.

Productive activities which directly take place in the realm of market forces are treated as employment. Market denotes exchange and in this sense work which has a direct exchange value is employment. In other words, when work is directly exchanged for a wage, it becomes employment. Work, on the other hand, does not necessarily mean earning a wage. For example, those who are engaged in household economic activities may not be receiving a wage as a direct payment for the work they perform; but they may be receiving or sharing the profit borne out of the output that they produce and market.

Sen (1975) notes that the concept of employment is vague in any economy in which the wage system is weak and self-employment and unpaid family labour are common because the criterion of 'being paid a wage" cannot be reliably applied. Accordingly, this vagueness was a problem confined to less developed economies where market system is less developed.

Employment has three aspects (Sen:1975):

(a) It gives an income to the employed;

(b) it yields an output;

(c) it gives a person the recognition of being engaged in something worth while.

Recently the concept of work and employment and distinctions between the two assumed a different dimension even in the well developed market economies primarily resulting from the changing technological conditions of production. During the industrial stage, employment was organized in a central place, say in a factory, all people had uniform working hours and uniform frequency in the payment of wages. In the post industrial phase, 'contractual systems of employment" emerged (Watts: 1983). Now work need not necessarily be organized in a central place. At present, with the revolution in the communication and information network, work can be very easily organized in the household itself. Therefore, people undertake contractual work and locate themselves away from the bureaucratic set up and industrial concerns. They finish the job and receive the payment. And this payment is not the same as wages. This is different from the conventional type of employment.

Self employment means working for oneself. Self employed are those who during the reference period performed some work for profit or family gain. This is different from wage employment, when one works for others for a fixed wage. Self employment is increasing rather fast in many of the less developed economies. Often it is suggested that educational systems should be re-oriented to equip individuals to be self-employed.

Another term which is very often used in literature on employment is under-employment. Under-employment exists when persons in employment who are not working full time would be able and willing to do more work than they are actually performing at present (ILO: 1984). Under-employment is of two types—visible and invisible. Visible under-employment means working less than a certain number of hours per year. This number of hours may be either the number of hours desired or the number of hours considered normal or appropriate. People are invisibly under-employed if more of them are engaged in a certain activity than would be needed to produce the output which they produce. (Monly and Costa: 1981). Their earnings are abnormally low, and their jobs do not permit full use of their capacities or skills. Under-employment of the educated is a serious problem in many of the developing economies.

Classification of the employed

Employment is very often discussed in terms of industrial classification and occupational classification. Industrial classification denotes the distribution of the employed by sectors of activity. According to the International Standard Industrial Classification of Economic Activities, the major divisions of industries are:

(a) Agriculture, hunting, forestry and fishing

(b) Mining and quarrying

(c) Manufacturing

(d) Electricity, gas and water

(e) Construction

(f) Wholesale and retail trade, restaurants and hotels

(g) Transport, storage and communication

(h) Financing, insurance, real estate and business services

(i) Community, social and personal services

(j) Activities not adequately defined.

It is generally believed that the relative distribution of workers between sectors is an indicator of the level of economic development achieved by any economy. The process of economic development is associated with a gradual shift of the work force from primary to secondary and further to the tertiary sector. Thus the least developed economy will have the highest proportion of its work force engaged in primary sector activities and the most developed economy will have the highest proportion of its work force engaged in the tertiary sector activities. It is to be noted here that, of late this shift is not —from primary to secondary to tertiary—in many of the less developed countries the tertiary sector is growing faster than the secondary sector. This is primarily due to the growth of service sectors in the tertiary sector due to the increased welfare measures adopted by the public authorities.

Occupational classification denotes distribution of employment between different occupational divisions. Till the seventies data on employment were collected as per the international classification of occupations (ISCO) adopted by ILO in 1958. In 1968 ILO revised the occupational classification. In the revised classification there are 8 major occupational groups, 83 minor occupational groups, 284 unit groups and 1,506 occupational categories. Because of this change in the occupational classification data are not strictly comparable over a period of time.[3]

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[3] However ILO provides conversion tables to make the figures comparable.

The International Standard Classification of Occupations gives the following major groups of occupations.

- 0/1. Professional, technical and related workers.
- 2. Administrative and managerial workers
- 3. Clerical and related workers
- 4. Sales workers
- 5. Service workers
- 6. Agriculture, aimal husbandry and forestry workers, fishermen and hunters.
- 7/8/9. Production and related workers, transport equipment operators and labourers.
- 10. Workers not classifiable by occupation and members of the armed forces.

Unemployment

Unemployment is the state of not working. Unemployment can be voluntary and involuntary. Those who are not working and not seeking an employment are treated as voluntarily unemployed. They do not come under the category of economically active population. Involuntarily unemployed are those who are not at work but are seeking work or available for work at the on-going wage rate. This category is important from the economic point of view. In discussions, unemployment unless otherwise qualified, refers to those who are involuntarily unemployed. Unemployment rate refers to the percentage of total unemployed population to the total labour force.

The general definition used by the ILO for unemployment includes all persons above a specified age who, on the specified day or for a specified week, came into one of the following categories:

(a) Workers available for employment whose contract of employment had been terminated or temporarily suspended and who were without a job and seeking work for pay or profit;

(b) persons who were available for work (except for minor illness) during the specified period and were seeking work for pay or profit, who were never previously employed or whose most recent status was other than that of employee (i.e., former employers, etc.), or who had been in retirement;

(c) persons without a job and currently available for work who had made arrangements to start a new job at a date subsequent to the specified period;

(d) Persons on temporary or indefinite lay-off without pay.

The following categories of persons are not considered by the ILO to be unemployed:

(a) Persons intending to establish their own business or farm, but who had not yet arranged to do so, who were not seeking work or pay for profit;

(b) former unpaid family workers not at work and not seeking work for pay or profit.

Unemployment is, very often, categorized into various types. Frictional unemployment denotes unemployment caused by industrial friction such as immobility of labour, ignorance of job opportunities; shortage of raw materials, break down of the machinery or plant etc. Seasonal unemployment refers to unemployment which is due to seasonal variations. Those employed in agricultural activities are subjected to seasonal unemployment if they do not plan for their employment in the off seasons in agriculture.

Structural unemployment refers to unemployment arising out of structural changes in the economy. Technological changes will result in structural changes in the production process. It may displace labour and result in structural unemployment.

Cyclical unemployment refers to unemployment resulting from the business cycles in the economy. During periods of depression many people are thrown out of employment and they are referred to as cyclically unemployed.

Perhaps the most important and most commonly discussed type of unemployment is disguised unemployment. Disguised unemployment means that a withdrawal of a part of the labour force from the traditional field of production would leave the total output unchanged (Sen: 1975). "In technical terms this will mean that the marginal productivity of labour, over a wide range, is zero" (Nurkse: 1953). Disguised unemployment is very common in all agriculture based labour surplus economies. A distinction is to be made between incidence and duration of unemployment. Incidence of unemployment is the percentage of unemployed in a given population group. It is the unemployment rate. Duration of unemployment denotes mean years or months unemployed since leaving education. (Sanyal: 1985).

Labour market

The labour market is the institution which mediates between demand for and supply of labour. It used to be believed that the price of labour—wage—is determined in the labour market depending upon the relative supply of and demand for labour.

The classical economists assumed full employment and hence the primary function of the labour market is considered to be to ascertain the price of labour services at a given point of time. Given the assumptions of homogeneity of labour units and flexibility of wages, equilibrium in the labour market was a general case and dis-equilibrium was only a temporary aberration. The neo-classicals, though did not subscribe to the classical assumption of homogeneity of labour units and considered that the primary function of labour market is to allocate and rationally adjust labour skills and labour demands so as to establish equilibriating wage rates.

From the educational point of view, different economists have emphasized different aspects of education which are given a premium in the labour market. In the human capital version, it is cognitive skills (Shultz: 1981), for Arrow (1973) it is the filtering or screening role, for Spence (1973) it is the signalling role of education which employers consider for recruitment. To Thurow (1972) Fields (1974) and Bhagawati and Srinivasan (1977) it is the hiring practice which is very important. However the radicals have shown that the labour market is segmented (Reich, et.al.: 1973). According to the theory, labour markets are divided into two: (i) primary and (ii) secondary labour markets. The primary labour market is characterized by employment stability, high wages, better working conditions and internal labour markets. Secondary labour markets are characterized by low skill requirements, low wages, poor working conditions, high labour turn over and no promotion avenues.

Some versions of the segmentation theory further divide the primary segment into two—upper and lower tiers. Jobs in the upper tier require decision making abilities whereas those in the lower tier involve routinized activities. Educational qualifications become a requisite for entry into the primary sector whereas they are not so essential in the secondary sector of the labour market.

A mention about internal and external labour markets is in order. Internal labour markets refers to the Labour Market internal to an organization primarily for promotion into higher posts. The external labour market is the usual recruitment place for any job. In an internal labour market, only employees of the same organization are candidates whereas the external labour market is primarily for the unemployed though the employed may also be part of it to improve their jobs prospects.

7. Wages

Wages, in the wider sense, is the reward for the factor of production namely labour and hence includes any payment for work whether it is work done for an employer or that of a self-employed person. In a narrow and more commonly used sense wages refer to payment to employed persons. Wage rate is the stated amount at which a person is hired.

Sometimes a distinction is drawn between wages and salaries. Wages are associated with lower level manual workers paid on hourly, daily or weekly basis whereas salaries refer to monthly or annual payments preferably for white collar employees.

Two important bases for wage payment or wage determination are: (i) payment by time; (ii) payment by results. (Robertson: 1961). Payment by time means deciding and paying a fixed amount of money to an individual with given and known characteristics for a certain specified period of time. Salary is the most common payment based on time. Salary is a pure time payment and the time period involved is normally monthly or yearly. Non-manual workers are usually salaried.

Payment by results is related to the actual work done. The work done can be measured in terms of (a) piece-work; and (b) time allowances. In the case of piece work the worker is remunerated according to the number of units of output he has produced i.e., the unit of output is priced as the criterion for payment. In time allowances the output is fixed rather than priced. Each work requires certain period of time for its completion or performance. There is a normal or standard time required for each work. The payment is based on this time allowed. The individual may take more or less time than this to finish the work. But he will be paid based on the standard time to be taken rather than the actual time taken.

A distinction is to be drawn between income, wages and earnings. Income is the flow of returns from property, estate or wealth. Wages are the reward or payment for work or employment. Earnings refers to the total of all types of receipts from any profession. Earning may be more than wages. Wage is the minimum that one gets from a profession or job whereas earnings are the maximum that one can receive from the profession or job and income is independent of profession.

The general trend is that there is a positive association between education and earnings. Therefore, education is considered to be an influential variable in explaining earning differentials between individuals. The human capital model is the most commonly used model for explaining earning differentials among individuals.

8. Labour mobility

Labour mobility refers to the movement of the labour force. Mobility can be spatial which denotes movement of labour from one region to another or from one country to another. This is sometimes refered to as labour migration. Migration within the confines of a country is called internal migration and between nations is called international migration.

Mobility can be from one employment status to another. This is more common where internal labour markets exist and promotion possibilities are wide-spread. This is referred to as vertical mobility.

Mobility can also be from one occupation to another occupation. The occupation may be of similar status. This is refered to as lateral or horizontal mobility. Persons with narrow fields of specialization have less chances of lateral mobility though their chances of vertical mobility are better.

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Chapter 4

Exercise 1.
Diagnosis of the employment situation

I. Working-age population, labour force and labour force participation rate

The economically active population or labour force comprises all persons of either sex who furnish - or would like to furnish - the supply of labour for the production of economic goods and services. It includes employed and unemployed persons and excludes students, women purely occupied in domestic duties, retired persons, etc..

1. Complete Tables 1 and 2.

2. Analyzing Tables 1, 2 and 3, state a number of factors which influence the labour force participation rate of men and women (and therefore the size of the labour force).

3. To what extent can education influence the labour force participation rate?

4. How do you explain the evolution of the labour force participation rate between 1971 and 1981?

Table 1. Working-age population, labour force and labour force participation rate by sex, 1971

	Total	Male	Female
1. Working-age population (10 years old and over)	9 354	4 839	4 515
2. Employed population ('000)	3 649	2 838	810
Unemployed population			
3. Unemployed actively seeking work	504	306	198
4. Unemployed not actively seeking work	335	168	167
5. Sub-total unemployed (3+4)	839	474	365
6. Labour force (2+5)	4 488		
7. Labour force participation rate (6/1)			

Table 2. Working-age population, labour force and labour force participation rate by sex and age, 1971.
(in thousands)

	Total	10-14	15-19	20-24	25-34	35-44	43-64	65 & over
Total								
Working age population	9 354.3	1 609.0	1 359.9	1 270.7	1 683.9	1 311.6	1 580.3	538.4
Labour force	4 488.0	80.6	511.6	840.4	1 147.9	863.3	904.2	138.2
Labour force participation rate	47.9%	5.1%	37.6%	66.1%	68.2%	65.8%	57.2%	25.6%
Male								
Working age population	4 839.0	820.9	688.7	639.6	856.7	681.2	859.3	292.4
Labour force	3 312.4	49.4	332.8	568.5	833.1	661.7	742.0	124.4
Labour force participation rate							86.3%	42.5%
Female								
Working age population	4 515.2	788.1	671.3	631.1	827.2	630.4	720.8	246.0
Labour force	1 175.6	31.2	178.8	271.9	314.7	201.6	162.2	13.7
Labour force participation rate							22.5%	5.5%

Table 3. Labour force participation rate by age and sex, 1981 (in percentages)

Sex/age	10-14	15-19	20-24	25-34	35-44	45-64	65 and over	Total
Total	4.0	29.9	57.8	63.6	62.6	50.4	20.9	44.4
Male	5.5	40.4	78.7	91.5	93.5	79.9	37.8	64.8
Female	2.4	19.0	36.8	35.2	30.5	18.1	4.0	23.1

II. Level of unemployment (1971)

1. Complete Tables 4, 5, 6 and 7.

2. Comment on Tables 4 to 8

- How would you define the situation of unemployment in Sri Lanka in 1971?
  - Who is primarily hit by unemployment (by age, sex and educational level)?
  - How does education affect: (i) the chances of somebody being unemployed; (ii) the fact that he or she would be actively seeking for work or not; (iii) the period for which he/she is actively looking for work.
  - How would you characterize the population not actively looking for work?

Table 4. Unemployment rate by sex, 1971 (in thousands)

	Total	Male	Female
1. Total labour force	4 488	3 312	1 175
2. Total unemployed population	839	474	365
Rate of unemployment (2/1 x 100)			
3. Unemployed actively job-hunting (3/1 x 100)	504	306	198

Table 5. Unemployment rate by age, 1971 (in thousands)

	Total	10-14	15-19	20-24	25-34	35-44	45-64	65 & over
Total labour force	4 488.0	80.6	511.6	840.4	1 147.9	863.3	904.2	138.2
Unemployed population	839.2	29.6	206.5	296.4	186.3	57.7	50.8	11.6
Unemployment rate %	18.6					6.6	5.6	8.3

Table 6. Unemployment rate by educational level 1971 (in thousands)

Educational level	Total labour force	Unemployed	Unemployment rate
No schooling	941.6	100.9	
Passed grades 1-10	3 150.2	614.7	
GCE "0" Level in 6 or more subjects	287.1	112.7	
"A" Level in 3 or more subjects	74.5	6.8	
Degree equivalent or higher	30.4	3.9	
Total	4 488.0	839.2	18.7%

Table 7. Unemployed population by period for which actively job-hunting (10 year and over)

				Period for which actively seeking work				
	Total unemployed	Not actively seeking work	Total actively seeking work	0-6 mnths	6-12 mnths	1 year	2 yrs	3 or more years
Total 000'	839.2	335.4	503.8	38.4	36.6	75.5	105.1	248.1
Percentage	100.0		100.0					

Table 8. Unemployed population and period for which actively job-hunting by educational attainment (in percentages)

	Total unemployed	Not actively seeking work	Total actively seeking work	Period for which actively seeking work				
				0-6 mnths	6-12 mnths	1 year	2 yrs	3 or more years
No schooling	100	71.8	28.2					
			100.0	12.8	9.0	16.2	18.0	44.0
Grade 4 or below	100	58.9	41.1					
			100.0	11.3	8.9	16.1	19.7	44.1
Grade 5 to 9	100	40.3	59.7					
			100.0	7.6	7.6	15.9	22.1	46.8
"0" Level in less than 6 subjects	100	23.7	76.3					
			100.0	6.9	7.2	15.4	22.2	48.2
"0" Level in 6 or more subjects	100	15.0	85.0					
			100.0	5.5	5.2	11.4	18.2	59.7
"A" Level in less than 3 subjects	100	18.3	81.7					
			100.0	5.5	5.1	12.3	18.6	58.6
"A" Level in 3 or more subjects	100	11.6	88.4					
			100.0	5.1	5.0	12.0	19.2	58.7
Degree level	100	20.5	79.5					
			100.0	7.9	8.6	22.9	20.7	39.8

III. Structure of the employed population

1. Structure of employment by status.
   Complete Table 9 and comment on Tables 9 and 10.

2. Employment structure by industry.
   Complete Table 11 and comment. How would you describe the growth of employment between 1963 and 1971 and between 1971 and 1981? Which economic sector employs the most people? How did the situation evolve in this respect between 1963, 1971 and 1981?

3. Employment by occupations and the occupation/industry matrix.
   Complete Tables 12 and 13. Comment on the change in the occupational structure between 1971 and 1981. Which industry employs most qualified manpower and how did the situation evolve between 1971 and 1981? Which factors can explain this evolution?

4. Employed population by educational level and occupation.
   Complete Table 14 and make general comments. How does the educational profile evolve with the occupation? Is there one typical educational level for each occupation? If not, could you make some suggestions on how to break these big occupational categories into more homogeneous ones as far as education is concerned. Do you think it feasible to define occupations perfectly homogeneous as far as their educational profile is concerned? Why not? Given what you have seen regarding the level of unemployment of school leavers, how is the educational profile of each occupation likely to change in the future?

Table 9. Composition of the employed population by employment status (1971) in thousands

	Paid employee	Employer	Self-employed	Unpaid family worker	Total
Total	2 428.9	113.8	913.7	193.3	3 648.8
	66.6	3.1	25.0	5.2	100.0
Male	1 806.9	107.5	823.1	100.8	2 838.4
					100.0
Female	623.0	6.3	90.7	90.5	810.4
					100.0

Table 10. Compositiion of the employed population by employment status and occupation (in %)

	Paid employee	Employer	Self-employed	Unpaid family worker	Total
Professional and technical workers	93.2	2.2	4.4	0.2	100.0
Administrative and managerial workers	89.5	7.2	2.8	0.5	100.0
Clerical workers	99.2	0.3	0.4	0.1	100.0
Sales workers	45.2	18.7	33.2	2.9	100.0
Service workers	88.5	2.8	6.6	2.0	100.0
Agriculture workers	49.8	1.4	39.7	9.1	100.0
Production workers	87.7	2.7	8.8	0.8	100.0
Total	66.6	3.1	25.0	5.2	100.0

Table 11. Employment structure by industry: evolution from 1963, 1971 to 1981

	1963		1971		1981	
	(000)	%	(000)	%	(000)	%
Agriculture	1 693	53.27	1 829		1 876	45.53
Mining and quarring	10	0.31	13		34	0.83
Manufacturing	313	9.85	349		425	10.32
Construction	86	2.71	104		134	3.25
Commerce	268	8.43	344		437	10.61
Transport	133	4.19	179		200	8.45
Finance	20	0.63	25		57	1.38
Services	655	20.61	807		957	23.23
Total	3 178	100.0	3 650	100.0	4 120	100.0

Total employment annual growth rate 1963-1971 = 1971-1981 =

Table 12. Employment structure by industry and occupation in 1971

	Professional technical	Admin. & managerial	Clerical workers	Sales workers	Service workers	Agricul. workers	Production workers	Others	Total
Agriculture	1 904	475	6 852	2 154	13 712	1 765 114	38 011	755	1 828 977
%	0.1	00.0	0.4	0.1	0.7	96.5	2.1	0.0	100.0
Mining	127	51	219	131	147	49	12 331	24	13 079
%	1.0	0.4	1.7	1.0	1.1	0.4	94.3	0.2	100.0
Manufacturing	4 986	2 130	12 494	10 324	4 972	5 701	306 497	1 868	348 972
%								0.5	100.0
Construction	2 485	255	4 723	412	2 444	451	92 209	582	103 561
%	2.4	0.2	4.6	0.4	2.4	0.4	89.0	0.6	100.0
Transport	2 738	979	51 053	588	4 861	624	116 104	1 929	178 876
%	1.5	0.5	28.5	0.3	2.7	0.3	64.9	1.1	100.0
Commerce	2 132	2 526	22 021	241 977	37 608	2 554	33 935	1 015	343 768
%								0.3	100.0
Banks & Finance	3 292	1 157	10 580	960	442	66	8 133	315	24 945
%	13.2	4.6	42.4	3.8	1.8	0.3	32.6	1.3	100.0
Services	160 824	6 344	78 200	15 819	133 792	7 575	319 171	84 968	806 693
%								10.5	100.0
Total	178 508	13 924	186 230	272 444	197 999	1 782 234	926 772	91 460	3 649 571
									100.0

Table 13. Employment structure by industry and occupation in 1981

	Professional/ technical	Admin. & managerial	Clerical workers	Sales workers	Service workers	Agricul. workers	Production workers	Others	Total
Agriculture	1 283	1 476	9 443	1 119	15 672	1 824 458	21 860	517	1 875 828
%	0.1	0.1	0.5	0.1	0.8	97.3	1.2	0.0	100.0
Mining	193	151	500	144	408	51	32 321	46	33 814
%	0.6	0.4	1.5	0.4	1.2	0.2	95.6	0.1	100.0
Manufacturing	8 639	8 522	27 049	8 022	12 373	6 370	350 841	2 899	424 715
%		2.0		1.9	2.9	1.5		0.7	100.0
Construction	5 670	2 322	11 421	279	5 965	338	107 393	580	133 968
	4.2	1.7	8.5	0.2	4.5	0.3	80.2	0.4	100.0
Transport	3 853	2 201	62 251	754	13 087	530	115 088	1 810	199 574
%	1.9	1.1	31.2	0.4	6.6	0.3	57.7	0.9	100.0
Commerce	3 117	5 400	31 054	295 699	61 256	1 439	37 982	1 371	437 318
%	0.7	1.2	7.1	67.6	14.0	0.3	8.7	0.3	100.0
Banks & Finance	6 613	4 939	24 114	2 069	7 520	70	11 069	533	569 267
%	11.6	8.7	42.4	3.6	13.2	0.6	19.4	0.9	100.0
Services	217 016	8 675	91 595	7 604	118 935	13 753	413 504	86 039	957 121
%		0.9		0.8		1.4		9.0	100.0
Total	246 405	33 701	257 525	315 764	235 259	1 847 109	1 090 403	93 798	4 119 965
%									100.0

Table 14. Distribution of employees by occupation and educational level, 1971

	Educational attainment					
Occupations	University degree	A level in 3 or more subjects	0 level in 6 or more subjects	Grade 1-10	No schooling	Total
1. Prof./tech.	22 296	57 004	44 039	47 665	7 484	178 488
%						100.0
2. Adm./manager	2 207	838	3 070	6 770	1 032	13 917
%						100.0
3. Clerical worker	2 539	4 624	55 632	113 220	10 129	186 114
%						100.0
4. Sales & service worker	624	1 295	23 542	371 282	73 502	470 245
%	0.1	0.3	5.0	79.0	15.6	100.0
5. Agricultural worker	607	1 293	15 779	1 182 151	582 304	1 782 134
%	0.0	0.1	0.9	66.3	32.7	100.0
6. Production worker	1 250	1 655	26 377	755 631	141 578	926 491
%	0.1	0.2	2.8	81.6	15.3	100.0
7. Others	952	1 003	5 975	58 797	24 729	91 456
%	1.0	1.1	6.5	64.3	27.0	100.0
Total	30 475	67 712	174 414	2 535 516	840 758	3 648 875
%	0.8	1.9	4.8	69.5	23.0	100.0

Chapter 5

Estimation of manpower demand and supply

by B.C. Sanyal

1. Objective of the session

During the previous discussions, the need for information on future requirements for qualified manpower has been emphasised to provide one of the bases for the planning of education. Some guidance is needed as to the direction that the development of education should take in quantitative terms to cater for future needs for skills. It is believed that forecasting of qualified manpower can provide this guidance. Although methods of forecasting have a lot of limitations (this will be discussed later), an increasing number of countries, especially from the developing world, are preparing manpower forecasts according to occupational and educational requirements within the framework of their development plans. The present session has therefore, as its objectives:

(a) to apprise participants of the different methods of projection of qualified manpower; and

(b) to sensitize them about the shortcomings of these methods as regards their adaptation to specific contexts.

2. Different methods of projection of qualified manpower needs

A variety of methods have been used to derive manpower forecasts in different countries. The dominant model is known in the literature as the "manpower requirements" method. The different steps of this particular model will be outlined and then discussed.

We shall adopt the methodology used in the OECD's Mediterranean Regional Project (MRP). This is for two reasons: first, this project provides the most extended number of "steps" in generating the manpower forecasts and, second, the MRP model (or some slight variant of it) is the one still used today by a great number of countries.[1]

The three major steps in qualified manpower forecasting are: (a) projecting the demand for educated manpower, (b) projecting the supply of educated manpower, and (c) balancing supply and demand. In what follows, we mainly consider the first step and its main stages, since we are dealing here with the manpower forecasts. Let us introduce the following symbols:

[1] Psacharopoulos G. and Debeauvais M. "Forecasting the needs for qualified manpower: towards an evaluation" in *Forecasting Skilled Manpower needs: The experience of eleven countries* Edited by R.V. Youdi and K. Hinchliffe, Unesco, Paris 1985.

P = population
L = Labour force
X = output
i = economic sector
j = occupation
k = educational level (or type)
T = target year of the plan
0 = base year of the plan

3. The demand side

The MRP methodology uses five main steps in assessing the required number of workers by educational level in the target year of the plan. These are as follows:

3.1 Step 1: Estimating the future level of output (X_T) for the target year

We know $\frac{X_0}{P_0}$ = GDP per capita in the base year.

Let r_1 represent the desired average annual growth rate in GDP per capita and r_2 the estimated growth rate of population.

Then GDP per capita in the target year T will be

$$\frac{X_0\,(1 + r_1)^T}{P_0}$$

and output in the target year will be

$$\frac{X0\ (1 + r_1)^T}{P_0} \times P_0\,(1 + r_2)^T = X_0\,(1 + r_1 + r_2 + r_1 r_2)^T = X_T$$

3.2 Step 2: Estimating the structural transformation of the economy or the distribution of GDP by economic sector

$$\frac{X_i}{X}$$

According to the International Standard Industrial Classification of Economic Activities, the major divisions of industries are:

i = 1. Agriculture, hunting, forestry and fishing
i = 2. Mining and quarrying
i = 3. Manufacturing
i = 4. Electricity, gas and water
i = 5. Construction
i = 6. Wholesale and retail trade, restaurants and hotels
i = 7. Transport, storage and communication
i = 8. Financing, insurance, real estate and business services
i = 9. Community, social and personal services
i = 10. Activities not adequately defined

In tabular form the structural distribution can be demonstrated as shown in Table 1 for the base year 0.

Table 1: Distribution of GDP by economic sector (base year)

Industry	GDP	GDP Share of total
Agriculture	$X_{1.0}$	$p_{1.0}$
Mining	$X_{2.0}$	$p_{2.0}$
Manufacturing	$X_{3.0}$	$p_{3.0}$
	⋮	⋮
Services	$X_{9.0}$	
Others	$X_{10.0}$	$p_{10.0}$
Total	X_0	1.0

Economic development, in particular, industrial development will change the share of different industries in the total GDP resulting in structural transformation of the economy.

The structural transformation will change the values of p_i ($i = 1, 2, \ldots 10$) depending upon the growth rates of each industry, which are often predetermined by policy.

$$p_{i.T} = \frac{X_i(1+s_i)^T}{X_T} = \quad = \frac{X_{i.T}}{X_T}$$

Where s_i is the average annual growth rate of the industry i.

Let us remember that $\sum_i p_{i.T} = 1$

and $\sum X_i \ (1+s_i)^T = X_T$

X_{iT} is target year contribution to GDP of the industry i, i = 1,2,...10

This will result in Table 2 for the economic structure of the country in the target year T.

Table 2: Economic structure of the country in target year T

Industry	GDP at year T	Share of GDP
Agriculture	$X_{1.T}$	$P_{1.T}$
Mining	$X_{2.T}$	$P_{2.T}$
Manufacturing	$X_{3.T}$	$P_{3.T}$
	.	.
	.	.
	.	.
Services		
Others	$X_{10.T}$	$P_{10.T}$
Total	X_T	1.0

3.3 Step 3: Estimating labour productivity by economic sector for target year and its change between base and target year

$$\left(\frac{X_i}{L_i}\right)$$

The productivity of labour for each sector is estimated from the GDP of each sector divided by the number of workers in that sector. For the base year, this can be represented in Table 3.

Table 3: Labour productivity of GDP by economic sector (Base year)

Industry	GDP	No. of workers	Labour productivity
i	X_i	L_i	X_i/L_i
Agriculture	X_1	L_1	$X_1/L_1 = q_{1.0}$
Mining	X_2	L_2	$X_2/L_2 = q_{2.0}$
Manufacturing	X_3	L_3	$X_3/L_3 = q_{3.0}$
	.	.	.
	.	.	.
Services	X_9	.	.
Others	x_{10}	L_{10}	$X_{10}/L_{10} = q_{10.0}$
Total	X_0	L_0	$X_0/L_0 = q_0$

Due to changes in the technology, means of production and organization of work, labour productivity will change in varying degrees for the different sectors. These changes are estimated from (1) past trends or (2) model country productivities or (3) international comparison or (4) experts' judgement or (5) a combination of several of (1) to (4).

Let the productivity growth rate estimated as above for the sector i = u_i, then

$$q_{i.T.} = q_{i.0} (1 + u_i)^T$$

Where q_{iT} = productivity of the sector i in the target year T. This gives us Table 4 for the target year.

Table 4: Labour productivity by economic sector (Target year)

Industry	GDP in year T	Productivity in year T	No. of workers in year T
Agriculture	$X_{1.T}$	$q_{1.T}$	$X_{1.T}/q_{1.T} = L_{1.T}$
Mining	$X_{2.T}$	$q_{2.T}$	$X_{2.T}/q_{2.T} = L_{2.T}$
Manufacturing	$X_{3.T}$	$q_{3.T}$	$X_{3.T}/q_{3.T} = L_{3.T}$
	.	.	
	.	.	
Services	$X_{9.T}$	$q_{9.T}$	$X_{9.T}/q_{9.T} = L_{9.T}$
Others	$X_{10.T}$	$q_{10.T}$	$X_{10.T}/q_{10.T} = L_{10.T}$
Total	X_T	q_t	L_T

The overall labour productivity can then be estimated as: $q_T = X_T/L_T$

3.4 Step 4: Estimating the occupational structure of the labour force within each of the economic sectors in the target year

$$\frac{(L_{ij})}{(L_i)}$$

The International Standard Classification of Occupations gives the following *major groups of occupations* :

j = 0/1: Professional, technical and related workers, for convenience let j = 1 in our case.
j = 2 : Administrative and managerial workers
j = 3 : Clerical and related workers
j = 4 : Sales workers
j = 5 : Service workers
j = 6 : Agriculture, animal husbandry and forestry workers, fishermen and hunters
J = 7/8/9: Production and related workers, transport equipment operators and labourers, for convenience let j = 7 in our case
j = 10 : Workers not classifiable by occupation and members of the armed forces, for convenience let j = 8 in our case.

First let us examine the occupational structure of the labour force within each economic sector for the base year. Within each sector we shall compute the proportion of each occupation listed above. (See Table 5).

Table 5: Labour force by occupation and economic sector (Base year)

Industry/ occupation	Professional	Administrative	Production	Others	Total
Agriculture	l_1	$l_{1.2}$	..	$l_{1.8}$	1.0
Mining	$l_{2.1}$	$l_{2.2}$	..	$l_{2.8}$	1.0
Services					
Others	$l_{10.1}$	$l_{10.2}$	..	$l_{10.8}$	1.0

Note that $l_{ij} = L_{ij/L_i}$ = proportion of labour force in sector i with occupation j.

$i = 1, 2 \ldots. 10;\ j = 1, 2 \ldots. 8.$

For the target year, the proportions will change because of changes in the economy, technological changes, changes in the means of production and in the organization of work, changes in the qualification level in the labour force, etc.

The method of incorporating these changes will be discussed later. For the time being, let us assume that: $l_{ijT} = a_{ij}\ l_{ij0}$ where l_{ij0} is the proportion of labour force with occupation j in the economic sector i for the base year and l_{ijT} is the same for the target year.

a_{ij} is the proportional change in l_{ij0}

$$aij \geqslant 0$$

For example, a_{ij} could be equal to $(1 + r_{ij})^T$, where r_{ij} is the growth rate in the proportion on average per year.

So we can have the target year labour force for each occupation within each economic sector once l_{ijT} values have been calculated because from Table 4, we already know the total labour force for each sector in the target year and $L_{ijT} = l_{ijT} \times L_{iT}$ where L_{ijT} is target year labour force in occupation j and sector i and L_{iT} total labour force in sector i in target year (see Table 6).

Table 6: Labour force by occupation and sector (Target year)

Industry/ Occupation	Professional	Administrative	Others	Total
Agriculture	$L_{11.T}$	$L_{1.2T}$	$L_{1.8T}$	$L_{1.T}$
Mining	$L_{2.1T}$	$L_{2.2T}$	$L_{2.8T}$	$L_{2.T}$
	.	.		
	.	.		
Services	.			
Others	$L_{10.1T}$	$L_{10.2T}$	$L_{10.8T}$	$L_{10.T}$
Total	$R_{1.T}$	$R_{2.T}$	R_{8T}	L_T

R_{jT} = Total no. of workers with occupation j.

This leads us to the final step:

3.5 Step 5: Estimating the educational structure of the labour force in given occupations within economic sectors in target year

$$\frac{L_{ijk}}{-L_{ij}}$$

As before, this is also done on the basis of the base year observations. First the educational levels and types (k) are determined and the number of workers with different levels and types of education within each occupation are noted. The proportion of each level and type of education within each occupation is computed. This proportion is the basis for future projection. The base year values of proportions (e_{jk}) can be demonstrated in Table 7.

The changes in these proportions are also determined for the target year in the same way as the changes in the occupational structure.

Let us assume that $e_{jkT} = a_{jk}\, e_{jk0}$

In a particular case we may have $a_{jk} = (1 + r_{jk})^T$, where r_{jk} is the average annual growth rate in the proportion of labour force with education k within occupation j.

Table 7: Proportion of educated in different occupations by level and type of education (Base year)

Occupation/ Education	Level and type						
	Post-graduate	Graduate	Senior secondary	Junior secondary	Primary	Others	Total
Professional	e_{11}	e_{12}	e_{13}	e_{14}	e_{15}	e_{16}	1.0
Administrative	e_{21}	e_{22}	e_{23}	...	....	e_{26}	1.0
	.						
	.						
Agricultural workers	.						
Production & related	.						
Services	.						
Others	e_{81}	e_{82}	e_{83}	..	...	e_{86}	1.0

e_{jkT} = proportion of labour force for the same in target year (T) and e_{jk0} is the same for the base year, a_{jk} is the change in the proportion e_{jk0} for education j and occupation k. Since we know the total number of workers for each occupation in the target year, we can easily obtain the total number of workers for each type of education in that occupation by multiplying the total number of workers by e_{jkT}

For example, to get the number of professionals needed with post- graduate degree (E_{11T}) we have to simply multiply R_{1T} by e_{11T} (see Table 7) or in general $E_{jkT} = R_{jT}\ e_{jkT}$, $j = 1, 2 ... 8$; $k = 1, 2 ... 6$. This gives us Table 8.

In the Table, F_{kT} = Total no. of workers required for the year T with education k to achieve the economic growth rate envisaged in our forecasts, based on the assumptions given above.

It should be noted that steps (1) to (3) pertain to general economic planning. Our concern as educational planners will be the last two steps which deal with occupational and educational forecasting. As indicated above, we shall give the different methods of forecasting the occupational structure below.

Several alternative ways have been used in different countries in their attempts to forecast the occupational structure:

(1) *International models*, i.e., to observe the occupational structure of a country at a more advanced level of development and hypothesize that this is the desired structure in the country where the forecast is being made.

Table 8: No. of educated needed for the different occupations by level and type of education (Target year)

Occupation/ Education	Post-graduate	Graduate	Senior secondary	Junior secondary	Primary	Others	Total
Professional	$E_{1.1.T}$	$E_{1.2.T}$	$E_{1.3.T}$	$E_{1.4.T}$	$E_{1.5.T}$	$E_{1.6.T.}$	$E_{1.T.} = R_{1.T}$
Administrative	$E_{2.1.T}$				$E_{2.6.T}$		$E_{2.T} = R_{2.T}$
Agriculturists							
Production							
Others	$E_{8.1.T}$					$E_{8.6.T}$	$E_{8.T} = R_{8.T}$
Total	$F_{1.T}$	$F_{2.T}$	$F_{3.T}$	$F_{4.T}$	$F_{5.T}$	$F_{6.T}$	L_T

This may consist in the use of Model country comparisons, for example, Puerto-Rico utilized the coefficients of the United States, and Italy those of France.

It may also be Group country comparisons such as the use of parameters estimated from many OECD countries.

(2) *Model firm comparisons,* i.e., to observe the occupational structure of the most modern or efficient firms and stipulate that their occupational structure can be adopted for the plan.

In the socialist countries, for instance, the "model firm" is taken to be the one using the latest technology.

(3) *Staffing norms,* i.e., to follow the advice of experts or simply intuitive insight of the planner and specify certain desired ratios of engineers-to-technicians, doctors-to-nurses, and so on.

This technique is often used in the agricultural sector in general and in the socialist countries.

(4) *Time series extrapolation,* to predict the occupational structure simply as a function of time following past trends:

This method has been used extensively in French planning.

$$L_{ij}/L_i = f(t)$$

In most cases, more than one of these methods is used depending on the economic activity being analyzed, as mentioned earlier.

It should be noted that changes in the occupational structure due to changes in the economy, especially technological changes, are to be taken into consideration at this stage.

3.6 Forecasting the educational structure

There exist, in general, two distinct classes of methods for expressing the forecast in educational terms: those working from occupation to education, and those which by-pass the occupational dimension and produce directly the forecast in terms of education. We have considered above the first class of methods.

The educational content of given occupations is found according to a typical, idealized structure (methods followed by French planners). It could also follow the international model, group country comparison or model country comparison method described above.

It should be noted here that possible substitution between education and occupation can be taken into account at this stage.

3.7 By-passing the occupational forecast

In this case, the educational structure is derived as a direct function of labour productivity, i.e.

$F_k = f(X/L)$ or from a more general production function where a labour utilization coefficient (b) links output to educated labour, i.e.

$F_k = b.X$

4. The supply side

4.1 Based on manpower demand

From the total number of workers required for the year T with education k and obtained in Table 8, one can estimate the intake to the relevant education/training. However, it should be remembered that output of a particular level and type of training depends upon the duration of the training. For example, let us estimate the intake necessary for the supply of Fkt number of workers required for the year T with education k. Let us assume that it take n years to graduate from this level and type of education. We can construct the following Table 9 remembering that in the base year o there are already students in the course for n years of studies, who will graduate during the next n years batch by batch. Those who were admitted in year -n (I-n) will graduate in year o (Go) and will be added to the workforce in year 1 (w1). Those who are admitted in year o (Io) will graduate in year n(Gn) and will be added to the workforce in year n + 1 (wn + 1).

Now let us look at Table 9. Column 1 gives the years starting from -n going through o, T-n ending at T, the target year of our forecasts. The year -n is included in the table because the students admitted in year -n will graduate in year o and are included in our stock of manpower. Column 2 gives the students admitted in a year corresponding to column 1 and are denoted by In for the year n. Column 3 gives the number of graduates corresponding to the intakes in Column 2. Note that it takes n years to graduate. So Go is the number of graduates in year o from an intake I -n n years earlier. The values in the column of graduates are obtained by multiplying the intake values by the corresponding transition rates from intake to graduation. These rates take account of dropout, repetition and failure. For simplicity it is expressed by one compact indicator say g.

For practical purposes this may remain constant. Then

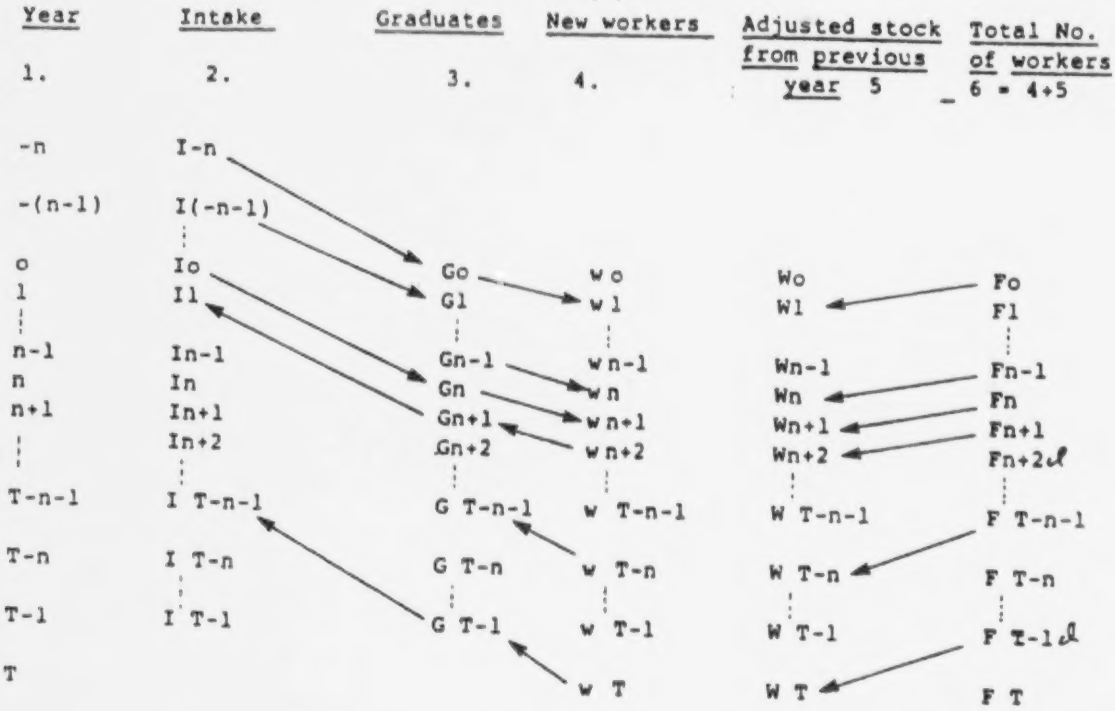
$$Go = I-n \ . \ g$$

and

$$Gn = Io \ . \ g$$

$$G_{T-1} = I_{T}-n-1 \ . \ g$$

Table 9: Intake forecasts for manpower supply with education type and level k for target year T



Year 1.	Intake 2.	Graduates 3.	New workers 4.	Adjusted stock from previous year 5	Total No. of workers 6 = 4+5
-n	I-n				
-(n-1)	I(-n-1)				
	⋮				
o	Io	Go	w o	Wo	Fo
1	I1	G1	w 1	W1	F1
⋮		⋮	⋮		⋮
n-1	In-1	Gn-1	w n-1	Wn-1	Fn-1
n	In	Gn	w n	Wn	Fn
n+1	In+1	Gn+1	w n+1	Wn+1	Fn+1
⋮	In+2	Gn+2	w n+2	Wn+2	Fn+2
	⋮	⋮	⋮	⋮	⋮
T-n-1	I T-n-1	G T-n-1	w T-n-1	W T-n-1	F T-n-1
T-n	I T-n	G T-n	w T-n	W T-n	F T-n
	⋮	⋮	⋮	⋮	⋮
T-1	I T-1	G T-1	w T-1	W T-1	F T-1
T			w T	W T	F T

Not all graduates will join the work force the following year. Some will drop out because of emigration, home conditions, personal and other reasons. Let the participation rate be h.

Let us denote the additional workers in year n by wn. Then

$$w1 = Go \cdot h$$

$$wn = Gn-1 \cdot h$$

$$wn+1 = Gn \cdot h$$

$$wT = G_{t-1} \cdot h$$

These values are given in column 4. Note that wn + 1 is predetermined because Gn is predetermined because Io is the intake in year o which should be known. Column 5 is the stock in a year adjusted from the previous year for loss due to death, resignation, emigration, retirement etc. Let us call this rate f.

The stock in previous years is given in column 6 as the total number of workers in a particular year. We know Fo the stock of manpower with education k in year o. We know also

$$F1 = Fo\,(1-f)\,(=W1) + w1\,(=Go.h)$$

Similarly we know all the values of F up to Fn + 1 but no more. And we know FT the target year requirement of total number of workers with education k from Table 8. How are intermediate values obtained? Let us assume a linear increase in the number of workers for the years from n + 1 to T as follows:

Years	Total No. of workers
$n+1$	F_{n+1} (known)
$n+2$	$F_{n+1} + \Delta$
$n+3$	$F_{n+1} + 2\Delta$
.	
.	
$T-1$	$F_{n+1} + (T-n-2)\Delta = F_{T-1}$
T	$F_{n+1} + (T-n-1)\Delta = F_T$

$$\text{Therefore} \qquad \Delta = \frac{F_T - F_{n+1}}{(T-n-1)}$$

Replacing Δ by the calculated amount, we get total number of workers for each year from n + 1 to T

$$\text{Now} \qquad W_T = F_{T-1}\,(1-f)$$

$$\text{and} \qquad w_T = F_T - W_T$$

Since we know the participation rate among the graduates

$$\text{we know} \qquad G_{T-1} = \frac{W_T}{h}$$

$$\text{and} \qquad I_{T-n-1} = \frac{G_{T-1}}{g}$$

Similarly we can compute all the values from I_{T-n-1} to I_1 So the intakes I1 to I T-n-1 will provide us with the necessary manpower F_T with level of education k in the target year T based on the rates of transition, participation and loss due to resignation, retirement, death, emigration etc. as assumed in the model.

Applying the same method, we can compute the intakes for all other types and levels of education.

4.2 Based on social demand

The supply projections involve three basic steps:

(1) Making population projections by school age groups. These projections take place according to any standard demographical model or, in certain cases, they are simple time extrapolations;

(2) Assessing the number of graduates by educational level and type. This follows the social demand model, namely school level transition probabilities are applied to the base population cohorts. These are followed through time until they exit the educational system, formal or non-formal.

(3) Determining the labour force participants. This is achieved by applying the sex-age-educational level specific labour force participation rates to the graduates generated in the previous step.

5. Balancing supply to demand

It is very unlikely that the demand for qualified manpower matches exactly the spontaneous supply assessed in 4.2. It is for this reason that a final exercise has to be undertaken, that is the adjustment to equate both sides, supply and demand.[2]

5.1 Revising the demand and/or supply projections

This is usually done in two simultaneous ways that are not mutually exclusive.

If (Ejk) as estimated from the demand side is very different from the (Ejk) assessed from the supply side, the manpower planner will most likely go back to his computations and revise some of the assumptions used in demand and supply projections.

It might be realized, for example, that, the productivity coefficients used for future labour on the demand side were too *optimistic*. Or else, for instance, the participation ratio adopted regarding the labour force on the supply side was too pessimistic. Several other assumptions could be re-examined in light of certain factors. By selecting other parameters than those assumed originally the planner can reconcile a great deal of the discrepancy between future supply of and demand for qualified manpower.

5.2 Formulating the final plan

This step is the only genuine policy action for identifying manpower surpluses or deficits not likely to be covered automatically by spontaneous supply and then arranging for the output of educational programmes to equal supply and demand at the target year of the plan. The output has also to be phased year by year up to the target year. The policy of intake is to be based on these output figures, taking into account failure, drop-out and repetition parameters and other losses and additions.

The supply of educated manpower may also be balanced with demand by computing the required output for each level and type of education adjusting for losses and additions. The intake to each level and type is to be computed from the required output, taking account of failures, drop-outs and repetitions. The total intake for each level and type is then to be distributed for each year among the institutions.

5.3 Other methods of projecting qualified manpower needs

(a) Tinbergen model: this is one variation of the MRP model. It bypasses occupational forecasts, neglects primary education enrolments and goes straight to estimating educational requirements, giving special attention to the required number of teachers, delineating the path of enrolments from the base year to the target year. It also pays special attention to the replacement of expatriates by national qualified manpower.[3]

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[2] The supply of manpower as projected in 4.1 will automatically match with the demand projections. However this need may not be the case with the projection f manpower supply as discussed in 4.2. For discussions on balancing supply to demand, supply projections of 4.2 are considered.

[3] Tinbergen J. and Bos H.C. "A planning model for the educational requirements of economic development" in Econometric Models of Education, Paris, OECD, 1965.

(b) Saturation norms method: saturation norms are ratios of qualified manpower to the total labour force or total production. These norms are established for different groups of enterprises and for different types of qualified manpower. When the total labour force or total output of production in the future is estimated, the number of qualified manpower needed can be determined.

(c) Personnel nomenclature method: the nomenclature is a list of posts to be filled by qualified manpower. It is drawn up by means of expert analysis of each sector of the economy, group of enterprises or even a single enterprise, for the target year based on an analysis of the existing situation and future means of production of goods and services. The coefficients of qualification structure for each sector, group of enterprises or single enterprise (ratio of specialists with higher education to those with specialized secondary education, for example) are used to determine the number and type of qualified manpower which will be necessary.[4]

In addition there are several other methods of projecting qualified manpower needs, namely, the input-output model, linear programming model, social demand model, labour absorption model, etc. These, however, do not have much practical application. (For details one may read the works referred to in the article by G. Psacharopoulos and M. Debeauvais cited earlier).

6. Problems encountered in projecting qualified manpower needs

The problems arise principally from the assumptions incorporated in the methods when they are put into practice. These are:

(a) The occupational distribution in an economic sector is not as rigid in practice as is assumed in the MRP method. Inter-occupational substitution occurs, generally due to economic changes, but especially due to technological changes, making the projection inaccurate.

(b) The educational distribution of the labour force for an occupation is also not as rigid in practice as is assumed in the MRP method. Substitution of a level and type of education within an occupation by another level and type does take place, further contributing to inaccuracy of the projection.

(c) In countries where the educational system is extremely diverse, it becomes difficult to relate the level and type of education to an occupation.

(d) Depending on wages, prices and availability, enterprises produce given amounts of output with widely varying mixes of labour and machinery, making any forecasting of manpower extremely difficult.

(e) Uncertainties about the economic growth of each sector, productivity changes, variation in the participation rates of the labour force and in the educational system, mobility of manpower, etc., especially when forecasts made relate to a long time period (as in the case of qualified manpower needs), make the task of projection extremely difficult.

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[4] Ivanov I.V. "Skilled manpower planning, forecasting and training in the USSR" in R.V. Youdi and K. Hinchliffe, op. cit.

(f) **In the saturation and personnel nomenclature methods, the total labour force or the total output are often over-estimated in practice because of extensive and intensive** involvement of the enterprises and the influence they exert on the estimations which is often subjective. The norms applied for determining the different types of qualified manpower are also subject to bias of the experts. Objective analysis is often impossible.

Finally, the available projection methods have not been able to take into account the rural-urban imbalance in manpower distribution and the costs of executing a manpower plan.

In spite of the above defects, these methods do provide some indication as to the direction education should take, especially when a country is committed to modernization, and an attempt is made to relate education with employment. With an improved information base, some of the defects can be rectified, although economic uncertainties will always exist. New methods of projection are expected to be developed using an information base which will provide signals for steering the development of education, with a continuous monitoring, feedback and control system.

Chapter 6

Projecting manpower demand and supply: an exercise on Sri Lanka[1]

by N.V. Varghese

Introduction

The purpose of this training module is to introduce the participants to an exercise on projecting demand for and supply of manpower. The treatment of the subject in this module is elementary and the data used for the exercise are on the Sri Lankan economy. The simulation exercise discussed in this module is developed using Lotus 1-2-3.

This module is divided into two parts:
Part I discusses the approach and the exercise and
Part II provides the solutions to the exercise

Part I of this module is formatted as follows:
Section 1 discusses the MRP approach used for projecting manpower demand.
Section 2 highlights some of the important data required for projecting demand for and supply of manpower.
Section 3 elaborates on the projection exercise.
Section 4 deals with the possible simulation exercises that can be undertaken by the trainees.

1. MRP approach

The manpower approach is one of the approaches to plan education. As per this approach, the projections of demand for different categories of manpower form the basis for determining enrolments and thereby provision of educational facilities in the schools and colleges.

There are various methods[2] to estimate manpower demand and supply. Perhaps, the most commonly used method is that of the Mediterranean Regional Project (MRP)[3] of the OECD. This method provides the steps involved in estimating manpower demand and supply. This module which attempts to develop a simulation exercise on manpower planning in Sri Lanka is based on the MRP approach.

The important steps involved in projecting manpower demand, as per the MRP approach are the following:

1. Estimating the Gross Domestic Product (GDP) for the target year.
2. Distribution of GDP by the economic sectors for the target year.
3. Estimating workers by economic sectors for the target year. This estimation needs the following:

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[1] I am grateful to Bikas C. Sanyal and Mathias Rwehera for their suggestions, comments and help. Needless to add that I, alone, am responsible for the errors and omissions that still may remain in the text

[2] For a comprehensive survey see Blaug (1970); for country experiences see Youdi and Hinchliffe (1985).

[3] Parnes (1964)

(a) GDP in the target year (which is estimated in steps 1 and 2)
(b) Labour productivity (which is to be estimated based on the assumptions of the model).

4. Estimating the distribution of workers by occupational classification in each economic sector for the target year.
5. Estimation of educational structure of the labour force for the target year.

Estimations in step 5 will provide the total number of workers required and their corresponding levels of educational qualifications for the target year. And this forms the basis for determining manpower supply (from the educational and training system).

The projection of manpower supply involves the following steps:

1. Total number of graduates required to meet the shortfall or surplus in each year. It may be noted that when there is unemployment among graduates, enrolment figures need to be adjusted accordingly. Therefore while estimating step 1 one has to take into account the prevailing unemployment situation.
2. The number of graduates required for replacement due to retirement, death, etc.
3. Steps 1 and 2 above will give the total number of new graduates to be employed.
4. The required output of the educational system to employ the total number of graduates as obtained in step 3. (All the graduates may not be entering the labour force. Therefore step 4 depends on the participation rates of the graduates of different levels).
5. The total number of students to be enrolled in each level of education to get the output of the educational system as estimated step 4. (This depends on the promotion rates).

2. Data requirements

It can be seen from the above discussions that planning education according to this approach requires a large amount of data pertaining to various aspects of the economic and educational system. Some of the important types of data required in this respect are listed below.

2.1 Data on the economy and employment

1. GDP in the base year.
2. GDP in the target year or growth rates of GDP between the base and target years.
3. Sectoral distribution of GDP in the base year and target year.
4. Distribution of labour force by industrial division in the base year.
5. Labour productivity in the base year.
6. Growth rates of the labour productivity by sectors between base and target years.
7. Labour force by occupational divisions in the base year.
8. Educational levels of the labour force by occupational division in the base year.
9. Labour force participation rates by levels of education.
10. Replacement rates (due to death, retirement etc.) of the labour force.
11. Unemployment figures by levels of education.

2.2 Data on the educational system

1. Structure of the educational system (primary = 1 - 5 years etc.).
2. Admission rates to class 1.
3. Class-wise enrolment at all levels of education during the previous years (at least for the ten years preceding the base year).
4. Class-wise promotion rates, repetition rates and dropout rates (for as many preceding years as possible).
5. If 4 is not available then graduation rates of each education cycle (primary, secondary, etc.) and stage transition ratios (transition rates from one cycle or stage of education to the other -- from primary to secondary, secondary to higher education etc.).

3. Projecting manpower demand and supply[4]

The manpower projection exercise discussed here is developed in Lotus 1 2 3 and is based on the MRP approach which was discussed in the previous section.

The present exercise involves three stages:

1. Projection of manpower demand for the Sri Lankan economy for the year 2000.
2. Projection of manpower supply for the Sri Lankan economy for the year 2000.
3. Balancing demand for and supply of manpower for the year 2000.

Needless to add, the projections of manpower supply (educational system) are derived from the manpower demand projections for the year 2000[5] Therefore, one may notice shortages/surpluses of different categories of manpower in the years preceding 2000. The attempt is to see how a balance between the demand for and supply of manpower can be attained in the year 2000.

Given the objectives and data limitation the projection exercise in this module is confined to university graduates and A level (12 years of schooling) graduates for the Sri Lankan economy.

3.1 Assumptions of the model

The basic assumptions of the model are:

(i) GDP growth rate and its sectoral distribution (Tables 1 & 2);
(ii) Growth rates in labour productivity (Table 3);
(iii) Occupational distribution of the labour force (Table 5);
(iv) Educational attainment of the labour force (Table 7);
(v) An employment rate of 0.95 for the university graduates (Table 9);
(vi) An employment rate of 0.67 for the A level graduates (Table 10);
(vii) Replacement rate of 0.03 (Tables 9 & 10);
(viii) Promotion rate of 0.6634 for university graduates (Table 11); and
(ix) Promotion rate of 0.8 for A level graduates (Table 12).

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[4] The data used for the simulation exercise is based on the statistics collected from the Sri Lankan census. The data and some of the basic assumptions used in this exercise are borrowed from a similar exercise undertaken at IIEP by S. Zouari Buattour (1987).

[5] The projections of demand for and supply of manpower in this exercise follow the MRP method as elaborated in detail by Sanyal (1988).

3.2 Computations

1. Based on the projected rates of growth of GDP and population (Table 1) calculate the GDP, population and GDP per capita for the year 2000.
2. Based on the projected percentage distribution of GDP by sectors (Table 2): (a) calculate the value added by different sectors in year 2000; (b) calculate the growth rates for each of the sectors.
3. Based on the rates of growth of labour productivity (Table 3) calculate the labour productivity in each of the sectors for the year 2000.
4. Based on the computations in Tables 2 and 3, calculate the distribution of workers by different sectors and the total number of workers by different sectors and the total number of workers.
5. Based on the percentage distribution of workers by economic sectors and occupational divisions (Table 5), calculate the total number of workers in each sector by occupational divisions.
6. Based on the projected levels of educational attainment of the labour force in different occupations (Table 7), calculate the number of university and A level graduates required for the year 2000.
7. Calculate the shortfall of University and A level graduates for the year 2000.
8. Assuming that the attrition rate is 3 per cent and labour force participation rate of university graduates is 95 per cent and that of A level graduates is 67 per cent, compute the number of university and A level graduates required each year upto the year 2000.
9. Assuming (i) a graduation rate of 0.6634 at the university level, and (ii) the intake will be increasing at an average annual growth rate compute the required university intake for each year up to 2000.
10. Assuming (i) a graduation rate of 0.80 at the A level, and (ii) the surplus will be equally shared in all the years, compute the required intake at the A level for each year up to 2000. (Tables 1 to 12 give the exercise).

4. A simulation exercise

As can be seen from the earlier sections, this model is based on a number of assumptions. All the assumptions need not always be realistic. Therefore it will be interesting to see what happens to the model if some of these basic assumptions are altered. This is very easy in this exercise since it is developed in Lotus 1 2 3. Therefore as a simulation exercise, the participants are requested to change the assumptions on the following factors and to see the resulting changes in the total manpower required and enrolments at different levels (University and A level in our example) of education.

(a) a change in the growth rates of GDP;
(b) a change in the distribution of GDP by sectors of origin;
(c) a change in the growth rates of labour productivity;
(d) a change in the occupational structure for the year 2000;
(e) a change in the assumed educational levels of the labour force for the year 2000.

A change in any of these assumptions will result in a different set of solutions regarding the projected figures. The advantage with this simulation exercise is that one can have more than one alternative projection regarding the manpower and educational scenarios for the country and the policy makers can use the one which is the closest to the reality.

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The manpower planning model: the case of Sri Lanka

This exercise is based on the MRP model and is developed in LOTUS 1-2-3.

The basic assumptions of the model are:

i) GDP growth rate and its sectoral distribution (Tables 1 & 2);
ii) Growth rates in labour productivity (Table 3);
iii) Occupational distribution of the labour force (Table 5);
iv) Educational attainment of the labour force (Table 7);
v) An employment rate of 0.95 for the university graduates (Table 9);
vi) An employment rate of 0.67 for the A level graduates (Table 10);
vii) Replacement rate of 0.03 (Tables 9 & 10);
viii) Promotion rate of 0.6634 for university graduates (Table 11); and
ix) Promotion rate of 0.8 for A level graduates (Table 12).

Sri Lanka manpower model

Table 1. Basic data and assumptions

Year	1971	1981	Growth rate 1971-1981	Growth rate 1981-2000	2000
GDP Per captia	1038.0	1395.0	3.0	2.8	
Population (000)	12720.0	14848.0	1.6	1.7	
GDP (millions)	13209.0	20706.0	4.6	4.5	

Table 2. Distribution of GDP by sectors

	Value added millions	1981 %	Value added millions	2000 %	Growth rate 1981-2000
Agriculture	5093.7	24.6		20.0	
Mining	704.0	3.4		5.0	
Manufacturing	2816.0	13.6		15.0	
Construction	1035.3	5.0		5.0	
Commerce	4037.7	19.5		20.0	
Transport	1967.1	9.5		10.0	
Finance	455.5	2.2		3.0	
Services	4596.7	22.2		22.0	
Total	20706.0	100.0		100.0	

Table 3. Labour productivity by sectors

	1981	Growth rate 1981-2000	Productivity in 2000
Agriculture	2717.0	2.0	3958.2
Mining	20971.0	6.2	65763.5
Manufacturing	6635.0	0.0	6635.0
Construction	7716.0	0.5	8483.0
Commerce	9231.0	1.2	11579.2
Transport	9785.0	2.2	14795.4
Finance	8105.0	1.5	10754.9
Services	4795.0	2.6	7808.9
Total	5026.0		

Table 4. Employment structure by economic sectors

	1981		2000	
	(000)	%	(000)	%
Agriculture	1876.0	45.5	2436.4	37.5
Mining	34.0	0.8	36.7	0.6
Manufacturing	425.0	10.3	1090.1	16.8
Construction	134.0	3.3	284.2	4.4
Commerce	437.0	10.6	832.8	12.8
Transport	200.0	4.9	325.9	5.0
Finance	57.0	1.4	134.5	2.1
Services	957.0	23.2	1358.5	20.9
Total	4120.0	100.0	6499.0	100.0

Table 5. Occupational distribution of workers by sectors for the year 2000 (percentages)

	Prof.& Technical	Admn & Managerial	Clerical	Sales	Service	Agricultural workers	Product. workers	Others	Total
Agriculture	0.15	0.35	0.50	0.20	0.90	96.95	0.95	0.00	100.0
Mining	1.10	1.75	1.85	1.00	1.65	0.25	92.30	0.10	100.0
Manufacturing	3.30	7.90	7.20	4.10	3.60	1.65	71.60	0.65	100.0
Construction	6.90	6.75	9.60	0.45	5.65	0.35	69.95	0.35	100.0
Transport	3.00	4.20	34.10	0.85	8.00	0.30	48.75	0.80	100.0
Commerce	0.60	2.55	4.30	78.65	9.45	0.20	4.10	0.15	100.0
Finance	13.30	24.00	33.30	5.40	11.50	0.10	11.80	0.60	100.0
Services	32.05	3.05	9.30	1.50	13.30	1.30	32.25	7.25	100.0

Table 6. Occupational distribution of workers by sectors for the year 2000

	Prof.& Technical	Admn & Managerial	Clerical	Sales	Service	Agri workers	Product. workers	Others	Total
Agriculture									
%									
Mining									
%									
Manufacturing									
%									
Construction									
%									
Transport									
%									
Commerce									
%									
Finance									
%									
Services									
%									
Total									
%									
% To the total Employment									

Table 7. Educational attainment of the labour force, 2000
Percentages

	University	A Level	University	A Level
Prof/Technical	20.0	40.0		
Admin.Managerial	25.0	15.0		
Clerical	3.0	5.0		
Other workers	1.0	2.0		
Total				

Table 8. Shortfall

	University level	A level
Stock, 1981	58 431	109 623
Demand, 2000		
Shortfall		
Req.Grth rate		

Table 9. Estimated number of university graduates, yearly distribution (1981-2000)

Employment rate =0.95

	to meet shortfall	to replace	new graduates to be employed	new graduates required	total graduates employed
1981					58431
1982					
1983					
1984					
1985					
1986					
1987					
1988					
1989					
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					

Table 10. Estimated number of A level graduates, yearly distribution (1981-2000)

			Employment rate= 0.67		
	to meet shortfall	to replace	new graduates to be employed	new graduates required	total graduates employed
1981					109623
1982					
1983					
1984					
1985					
1986					
1987					
1988					
1989					
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					

Table 11. Student intake required to meet the shortfall: University level

	Intake	No of graduates	Required graduates	Balancing demand and supply
				Shortage
1977	4996			
1978	4661			
1979	4857			
1980	5020			
1981	5355	3314		
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				

Table 12.Student intake required to meet the shortfall: A level graduates

	Intake	No.of graduates	Required graduates	Balancing demand and supply
1979	80047			
1980	72354			
1981	82158	64038		
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				

Chapter 7 (A)

Earnings functions: theory

B. Camara, BREDA/Unesco

Wage and income policies are a matter of great concern in developing countries especially in Africa where various countries are undergoing adjustment programmes in order to overcome the acute economic and social crisis. When studying the present situation of wage and income distribution, one has to consider different factors that determine to a great extent the dynamics of the phenomenon.

The historical approach shows the colonial heritage in terms of salary and income distribution. Many African countries have maintained the structural imbalances left by the previous political period. Moreover, the inequalities have worsened, creating a dramatic situation in rural areas as well as in urban ones. Therefore, the inter-relations between growth, employment, education and earnings must be given due attention in the search for long-lasting solutions to the development of African economies and societies.

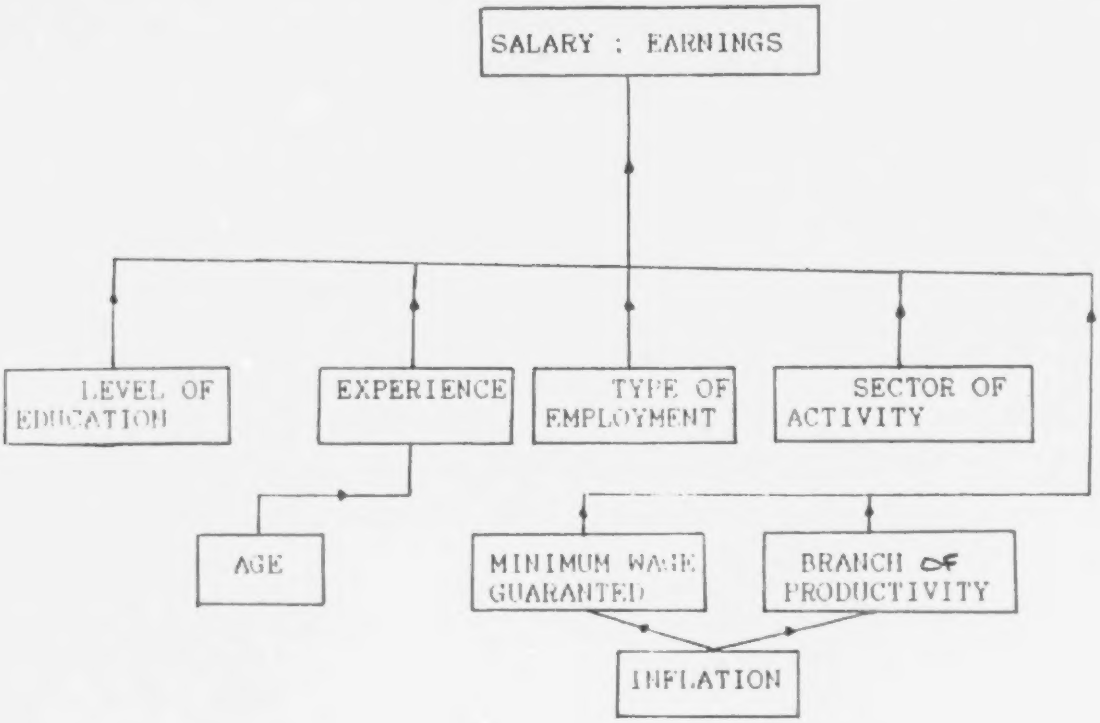
As far as study of the inter-relations is concerned, there are useful methods of statistical and econometric analysis which can provide a better understanding of the underlying relationships. Particularly in the area of earning functions, tools are available for relevant identification and analysis of relations linking salary levels and other quantitative and qualitative variables.

I. Identification of underlying relationships

Data collected from specific surveys on salary distribution constitute a basis for sound analysis of relations. Obviously the quality of the analysis depends very much on the quality of data used. Necessary statistics do not relate only to salary variables but include also information on factors and variables that may have a significant influence on the level of earnings, such as economic growth, productivity, inflation, educational level, type of occupation etc.

According to the wage theory adopted, a specific set of explanatory variable is used. However, the testing of assumptions is a crucial step in the study of earnings functions. Before choosing the variables, it is important to analyze the economic and social links within the context referred to. The choice must not be made at random. The mechanisms which determine the level and evolution of earnings need to be highlighted. This analysis can help in reducing the number of preliminary explanatory variables. That is the case when two or more variables are strongly inter-related. As an example, one can find a close relationship between age and number of years of experience. Thus in order to consider both variables as explanatory variables, we may retain only one, say experience instead of age to explain earnings level.

The following figure shows some basic links between certain economic and social variables and salary.



As one can see, salary is explained by both social and economic variables and by quantitative and qualitative variables as well. The qualitative variables chosen are: the Level of Education (LE), the Type of Employment (TE) and the Sector of Activity (SA), these variables are expected to play a significant role in the determination of the salary. In fact the wage policy is generally based on the type of employment linked with the level of education particularly in the modern sector. Cadres with engineering or business administration occupations very often have the highest salaries in the economy and they belong to the sub-population of graduates. If we look at the situation of school teachers having secondary level education, their salaries are lower than those of graduates and post-graduates. Moreover, as to workers with primary education level or illiterates, the salaries are usually very low compared to other groups. As a matter of fact, they constitute the majority of the available labour force or manpower, with the lowest earnings and standard of living.

In African developing countries, inequalities also exist according to the sector of activity. Distribution of salaries in the agricultural sector may differ from the distribution in the industrial sector or in the sector of trade and services. These differences can be explained by various factors such as the importance given to a sector, almost at the expense of the other sectors, the basic structure of the economy, the balance of power between actors in the economic field, sector productivity, category of workers paid at that level. In addition to this, the other sectors may also adjust according to increases of the minimum wage. There is a sort of cascade effect generated by the variation of this explanatory variable.

As regards productivity, sectors with high productivity often have high salaries, due to capacity and achievements in production. Improvement in productivity may have an impact on income distribution, especially for workers with limited earnings. On the other hand, inflation increases production costs, and therefore undermines the potential of productivity.

A preliminary economic analysis has to be undertaken before carrying out any statistical or econometric methods. The main difficulties to be dealt with relate to the combination of both academic theories and empirical studies on wages and earnings.

I. Description of retained variables

Several statistical methods can help in the confirmation of certain assumptions or relationships. Nowadays, with graphic editors on micro-computers, various scenarios are easily and quickly performed, thus enhancing the accuracy of empirical studies. Simple graph editing contributes to showing the trend of evolution of explanatory variables compared to the evolution of the explained or dependent variable, here the salary. When analysing the trends the number of retained variables may be modified if the result of the data plotting is not satisfactory.

Apart from graphic editing, the dummy variables are commonly used in building earning functions based on both quantitative and qualitative independent variables. For qualitative variables, once their modalities are defined, the use of dummy variables containing only two figures: 1&0, provides a means to characterize each modality. As an example, one of the qualitative variables noted previously, say the level of education, may be classified into three modalities: Primary, Secondary, and Higher education levels. If an observation relates to the Secondary level, the corresponding dummy variables gives 0 for Primary, 1 for Secondary, 0 for Higher education. The procedure is the same if the observation refers to any of the other modalities.

Econometrics has developed the technique of dummy variables, mainly for processing of qualitative variables, an example is as follows:

A set of six observations:

Primary	Secondary	Higher	Total
1	0	0	1
0	1	0	1
0	1	0	1
0	0	1	1
0	0	1	1
1	0	0	1

If we add the values of the three modalities per observation, we obtain the unit-vector composed of the figure 1. This has an important consequence on the form of the earnings function which can be derived from the first analysis. In fact, one cannot use all modalities in an earnings function if there is an intercept i.e. a constant term already in the equation set.

Say SALi =a0 +a1*PRi + a2*SCi + a3*HIi

a0 is the constant term

a1, a2 and a3 are respectively the coefficients of Primary (PR),

Secondary (SC) and Higher education (HI) dummy variables. The index i denotes the observation being processed.

Let us write the equation in a vector form; the following relation is obtained:

SAL = X*A ; with
SAL1 1 1 0 0
SAL2 1 0 1 0

SAL = : 1 : : :
SALi X = 1 : : : A = (a0, a1, a2, a3)

: 1 : : :
SALn 1 : : :

Considering the X matrix, we notice as indicated earlier, that the first column is equal to the sum of the three other variables; therefore, its column is a linear combination of the remaining three columns. So, the X matrix is a singular one : its determinant is zero.

In regression calculus, this is a key point for the validity of the method. Thus to avoid the constraint, we have to drop one of the dummy variables, which will be considered as a reference basis for the other complementary dummy variables.

Hence, the resulting equation will be:

SALi = a1 + a2*SCi + a3*HIi + Ui

Instead of having three explanatory variables, only two are included in the equation. The coefficient of the dropped variable has become the intercept (a1) of the earnings function. The last term Ui is the random error in the regression analysis.

Now, if we consider the two other qualitative variables mentioned in the figure, we may determine several modalities for each, according to data availability and analysis purposes.

We shall identify four modalities for type of employment, and three modalities for sector of activity.

Type of employment (TE)	Sector of activity (SA)
- Cadres and managers (TE1)	- Primary sector (SA1)
- Technicians and employeesTE2)	- Secondary sector (SA2)
- Skilled workers (TE3)	- Tertiary sector (SA3)
- Unskilled workers (TE4)	

Finally we get the following set of variables in the econometric analysis of the earnings function:

SA = f (LE, EX, TE, SA, MW, BP)

As previously stated, one must drop one of the dummy variables for each qualitative variable. For the type of employment, we chose unskilled workers as a reference basis; and also the primary sector for the same purpose. Thus, the earnings function comprises seven (7) dummy variables (LE2, LE3, TE1, TE2, TE3, SA2, SA3) and three quantitative variables (EX, MW, BP).

III. Estimates and validity of earnings functions

Econometric methods such as regression analysis, give estimates of the coefficients of the earnings function and also test the validity of the equation. When carrying out regression analysis attention must be paid to the following two problems.

Multicollinearity: this means that two or several explanatory variables are highly correlated. One way of identifying multicollinearity is, after the preliminary economic and social analysis, to compute the correlation matrix which contains all correlation coefficients for each combination of two variables among the entire set of variables. If a correlation coefficient is almost equal to 1, there is no need to retain both variables in the function; one will be sufficient.

Autocorrelation: For various events which occur regularly at short intervals such as salary payments the preceding values of both explanatory variables and dependent variables may have a relative impact on the current value of the explained variable. Whenever that is the case, it is necessary to use the autocorrelation test known as Durbin-Watson test. If autocorrelation exists, one way to correct it, to a certain extent, is to introduce lagged variables. For example, with first order autocorrelation of dependent variables we can have:

$$SALt = a0 + a1*SALt-1 + a2*MWt + a3*BPt$$

In this function the salary at period t is explained by the salary at period t-1, and by the minimum wage and branch productivity at period t.

Autocorrelation analysis may lead to the study of sophisticated econometrics methods such as ARIMA models (Autogregressive integrated moving average models), which is not the purpose of the present paper.

Presentation and analysis of results

"Student" or t- test

The standard way of displaying econometric results is to give, in addition to the equation, the corresponding values under each coefficient; for the coefficient of determination R2 (R squared); the value of the Durbin Watson test DW; the standard error of estimate (SEE); and the number of observations or time period.

SALi = a1 +	a2*SCi +	a3*HIi	R2:	No:
(ta1)	(ta2)	(ta3)	DW:	SEE:

The values in parentheses represent the null hypothesis test for each coefficient. Given the number of observations, one computes the degrees of freedom which are equal to (n-k); n is the number of observations, and k, the number of coefficients.

Example: SALi =	3.4 +	5.2*SCi+	13.2*HIi	R2:0.92	n:30
	(5.2)	(1.7)	(2.8)	DW:1.97	SEE: 18

Analysis

Having chosen a critical point, say 1%, which means 99% probability, the statistical table in this test gives us the critical value corresponding to the degrees of freedom computed.

For the above example, the function has 27 degrees of freedom :n-k = 30 - 3 = 27. AT 1% of critical point, the t distribution gives the critical value : 2.743. Therefore, if a figure in parenthesis is greater than the critical value, the null hypothesis for the relevant coefficient can be rejected. In other words, the corresponding variable has a significant impact on the dependent variable, which is the salary.

Examining the computed student values in the equation given, one may notice that only the coefficient of the variable SC is not significant. Thus secondary education level does not have a significant impact on the level of salary, according to the set of data processed, whereas for primary and higher education levels, the impacts are notable.

R2 expresses the proportion of explained variance according to the explanatory variables. The more R2 approaches 1, the greater the significance. For the function analyzed, 92% of the total variance is explained by the retained variables.

As seen earlier, the Durbin-Watson test is a test of autocorrelation. If the value of DW computed is around 2, then one can conclude there is no autocorrelation of random errors. Otherwise the Durban Watson statistical table gives the values of DL and DU corresponding to Durbin lower and Durbin upper.

If $DW < DL$ there is autocorrelation
$DW > DU$ there is no autocorrelation
$DL < DW$ DU no conclusion can be reached.

The results presented above give 1.97 for the value of the Durbin-Watson, which is almost 2. More precisely, the Durbin-Watson statistical table indicates (for 30 observations at 1% critical point) : DL = 1.07 and DU = 1.34. So in our case, DW being greater than DU, we can conclude there is no autocorrelation.

As concerns the Standard error of estimate, which is the last element of the results, it helps in approximately defining an interval for the dependent variable.

If the estimate of SA is 150, the corresponding interval is : SA-SEE = 150 - 18 = 132; and SA + SEE = 150 + 18 = 168.

Thus the acceptable values of the salary estimate should be found within the range 132;168.

Fisher test

Apart from the student test or t test, the Fisher test which applies the null hypothesis to all coefficients at the same time, can also be used. This test deals with two parameters: k-1 and n-k.

k-1 is the number of explanatory variables; and n-k equals the degrees of freedom.

F (k-1, n-k) at 1% critical point, gives for k=3 and n=30, the derived value 7.63. If n were equal to 28 the value read on the table would be 7.77.

Similar to the student test, if the Fisher value computed is greater than 7.63 we can reject the null hypothesis. Otherwise the set of coefficients is not significantly different from the zero-vector; consequently the earnings function is not appropriate.

One should note that the overall test of coefficients by the Fisher method, does not provide much information on the accuracy of a coefficient for a given explanatory variable. It is the t test which gives a more relevant appreciation for a precise variable. Thus the tests are complementary. Furthermore the Fisher value has a defined link with R2, the coefficient of determination:

$$F = \frac{R2 / k-1}{(1-R2) / n-k}$$

F and R2 are used in the analysis of variance

Due to this fixed relation between F and R2, once we have the student values and R2, an appreciation of the validity of the earnings function can be obtained.

IV. Application: Average earnings in Swaziland

Study of the earnings function is facilitated by available tools such as computer packages using econometric methods. Among these programmes the most well known are SPSS (Statistical Package for Social Sciences); TSP (Time series Processing); Lotus 123 which is a spreadsheet package. For econometric analysis, the first two packages are more efficient.

However, with Lotus, we do have regression results like: the estimates of coefficients, their standard deviation and the R squared. The use of Lotus is easier than the preceding packages. Moreover graphic editing and modelling can also be efficiently done with this package.

Application to the case of Swaziland gave the following results:

Comparing earnings functions in private and public sectors, we find that for the public sector the field or sector of activity and the type of occupation have a significant impact on average earnings, whereas for the private, only the type of occupation and gender have a significant impact. In the private sector particularly the regression results are not acceptable when we use absolute values of earnings, but when we run regression using the logarithm values of average earnings, then R2 jumps from 0.47 to 0.70. This means that the variations in earnings between categories are large.

For the public sector, using logarithm values of average earnings, R2 improves: .84 as against .72 previously. Therefore one can conclude that earnings inequalities are greater in the private sector than in the public sector.

As far as gender is concerned, this variable has notable impact on earnings in the private sector, but not in the public sector since the coefficient is statistically equal to 0. Thus gender equality is more effective in the public sector than in the private sector.

The following Tables are based on the statistics provided by the Central Statistics Office of Swaziland for the year 1987. The example analyzed shows the importance of appropriate methods for a better understanding of economic and social reality.

Public Sector

Earnings explained by sector of activity and type of occupation

(absolute values of earnings)

Regression output :

Constant	-38.5009
Standard error of estim. Y	238.8077
R square	0,716283
Number of observations	79
Degrees of freedom	70

Coefficient(s)	X 338.4078	274.7249	-70.2025	746.7309	980.0541	258.1428	392.9771	184.2080
Stand. devi. coef.	87.46634	77.27050	54.28505	92.27219	92.07238	90.26083	94.09889	92.07238
Student values	3.869	3.555	-1.293	8.093	10.644	2.860	4.176	2.001

Public Sector

Earnings explained by sector of activity, sex and type of occupation

(logarithm values of earnings)

Regression output :

Constant	2.054220
Standard error of estim. Y	0.131568
R square	0.838636
Number of observations	79
Degrees of freedom	70

Coefficient(s)X	0.249385	0.238124	-0.05309	0.703639	0.803653	0.384638	0.470354	0.305817
Stand.devi. coef.	0.048188	0.042571	0.29907	0.050836	0.050726	0.049728	0.051842	0.050726
Student values	5.175	5.594	-1.775	13.841	15.843	7.735	9.073	6.029

Public Sector

Earnings explained by sector of activity and type of occupation

(logarithm values of earnings)

Regression output :

Constant	2.025086
Standard error of estim. Y	0.133548
R square	0.831370
Number of observations	79
Degrees of freedom	71

Coefficient(s) X	0.254953	0.239861	0.709995	0.805925	0.384638	0.474957	0.308089
Stand. devi. coef.	0.048809	0.043200	0.051473	0.051473	0.050476	0.052556	0.051473
Student values	5.223	5.552	13.794	15.657	7.620	9.037	5.985

Private Sector

Earnings explained by sector of activity, sex and type of occupation

(absolute values of earnings)

Regression output :	
Constant	523.0668
Standard error of estim. Y	558.3506
R square	0.471543
Number of observations	104
Degree of freedom	95

Coefficient(s) X	-141.567	-166.391	-329.407	1089.222	1155.722	248.0555	530.7221	58.94444
Stand. devi. coef.	150.7619	142.1224	110.1317	186.1169	186.1169	186.1168	199.7046	186.1168
Student values	-0.939	-1.171	-2.991	5.852	6.210	1.333	2.658	0.317

Private Sector

Earnings explained by sector of activity, sex and type of occupation

(logarithm values of earnings)

Regression output :	
Constant	2.368733
Standard error of estim. Y	0.207679
R square	0.705187
Number of observations	104
Degree of freedom	95

Coefficient(s) X	0.022407	0.033082	-0.18177	0.766753	0.753617	0.373502	0.502067	0.142033
Stand. devi. coef.	0.056076	0.052862	0.040963	0.069226	0.069226	0.069226	0.074280	0.069226
Student values	0.400	0.626	-4.437	11.076	10.886	5.395	6.759	2.052

Private Sector

Earnings explained by sex and type of occupation

(logarithm values of earnings)

Regression output :	
Constant	2.390770
Standard error of estim. Y	0.205951
R square	0.703972
Number of observations	104
Degrees of freedom	97

Coefficient(s) X	-0.18150	0.766753	0.753617	0.373502	0.502876	0.142033
Stand. devi. coef.	0.040614	0.068650	0.068650	0.068650	0.073619	0.068650
Student values	-4.469	11.169	10.978	5.441	6.831	2.069

Chapter 7 (B)

Practical exercises on: the earnings function

Ulla Kann and Bikas C. Sanyal

1. Objective of the session

We have indicated in the previous session that education is not the determining factor for employment, nor is employment the only objective of education. Employment of an individual depends on several factors. The employment career is subject to similar phenomena. Earnings and employment reflect in a certain way the performance of individuals in their employment career. The objective of this session is:

1. To demonstrate the association of different factors, including education, with earnings of workers.

2. To identify the relative importance of different factors.

3. To acquaint participants with earnings functions and demonstrate how they can be constructed with the use of computers.

4. To show the use of earnings functions in explaining different views on relating education to employment.

5. To sensitize the participants to the limitations of earnings functions in explaining the relationship between education and employment.

2. Age-earnings profile by level of education

Figure 1 shows that earnings of individuals vary (1) with age and (2) with level of education. For each level of education, earnings vary with age, and for each age, earnings vary for different levels of education.

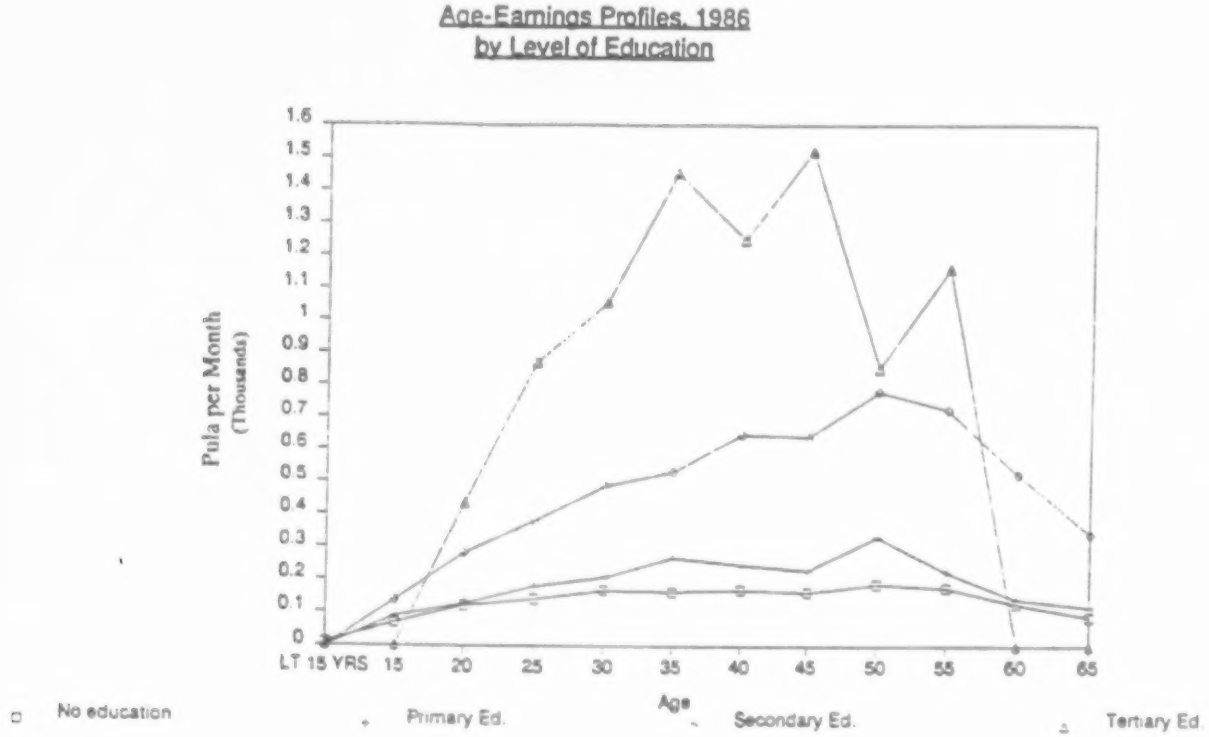
3. Earnings profile by education and sector of employment

Earnings also vary by sector of employment of the individual as shown in Table 1. One may observe that for each sector of employment in Botswana, average earnings vary for different levels of education and for each level of education, earnings vary for different sectors, although to a differing extent.

4. Earning by level of education and gender

For each level of education, earnings vary between male and female workers as is shown in Table 2.

Figure 1.



Age-Earnings Profiles, 1986
by Level of Education

Source: mployment Survey, 1986.

Table 1.

Average Monthly Cash Earning by Level of Education and Sector

Level of Education	Central Govt. (1)		Local Govt. (1)		Private/ Parastatal (1)	
None	152.28	(0.49)	177.57	(0.69)	147.29	(0.66)
Primary	217.85	(0.69)	206.68	(0.80)	195.09	(0.87)
Secondary	356.23	(1.14)	373.94	(1.44)	397.84	(1.78)
Tertiary	779.90	(2.49)	658.85	(2.55)	1117.01	(4.99)
Average	313.82	(1.00)	258.81	(1.00)	233.81	(1.00)

Source: Central Statistics office, Employment Survey, 1986

(1) Ratio: Salary by educational level as related to average salary in sector.

Table 2.

Average Monthly Salary by Education and Gender

Education Level	Male	Female
None	154.44	105.42
Primary	222.61	154.84
Secondary	413.06	342.11
Tertiary	1011.72	703.81
Not Known	208.49	229.31

Source: Central Statistics office, Employment Survey, 1986 Republic of Botswana,1986).

Table 3.

Average Monthly Earnings by Institutional Source of Training (Pula)

Source of Training	*Earnings*
Brigades	401
Polytechnic	754
Government Department	499]
Parastatal	357] 416
Private Company O-J-T	408]
Private Company Training School	618
Overseas	714

Source: Hinchliffe K. et al 1988

5. Earnings and institutions of training

Earnings vary also by institution of training, as reveled by the data collected in a special survey in Botswana (Hinchliffe et al, 1988). The above evidence shows that many factors influence the earnings of an individual in his or her employment career. We have only tested a few so far, namely age, sex, sector of work, level of education, institution attended. Other factors which influence earnings are work experience, occupation, home region, subject of specialization, parental education, occupation and income, ethnic origin, etc.

6. Earnings function

The relationship between earnings and the influencing variables can be expressed in mathematical form: Earnings = f (age; education; sex; sector of work, occupation ..)
The simplest form of this functional representation is given by a linear relationship between earnings and the other variables as follows:

Earnings = a + b_1 (age) + b_2 (education) + b_3 (sex) + b_4 (sector of work) + b_5 (occupation + ...

This can be further simplified by limiting the influencing variables (explanatory variables) to those which are quantitative. For example:
y (earnings) = a + b_1 (age) + b_2 (number of years of education completed) + b_3 (parents income)
In this case, a, b_1, b_2.. can be given some precise interpretation, b_1 =change in earnings for unit change in age when other variables remain the same. b_2 = change in earnings for unit change in years of education when other variables remain the same. b_3 change in earnings for unit change in parents income when other variables remain the same and a is a constant term giving the theoretical earning when all other variables become zero.

Such a mathematical function explaining the earnings is called an earnings function. (Qualitative variables such as sex, ethnic origins .. can also be considered as explanatory variables and their relative effects measured).

The values of a, b_1, b_2, b_3 etc. can be calculated from data on earnings of individuals and the corresponding values of other variables for these individuals, by computer with the use of a suitable computing programme (the most popular is called SPSS). The method of analysis is called multiple regression analysis. a, b_1, b_2 .. are called "regression coefficients".

The computer also gives (1) indications if a particular coefficient is significantly different from zero, and (2) the coefficient of determination R^2 showing the extent (in %) that the function (model) has been able to explain the variation in earnings (the prediction capacity of the model).

7. Example

A recent survey conducted in Botswana of a representative group of workers gave data on earnings (y), age of individuals (x_1, number of years of education (x_2) and number of years of training (x_3). The following equation was obtained as the earnings function. Earnings in Pula (y) = $-731.6 + 24.9x_1 + 52.4x_2 + 46.2x_3$ and $R^2 = .46$.

This shows that for unit change in age i.e. one year increase or decrease in age, earnings will increase or decrease by 24.9 Pula. One year additional year of education will increase earnings by 52.4 Pula and one additional year of training will increase earnings by 46.2 Pula. The model has been able to explain 46% of earnings i.e. 46% of the difference in workers' earnings are associated with differences in their age, education and training. The remaining 54% of the earnings variation is due to factors which were not considered in the model.

8. Exercise

The following earnings function was derived from a survey of workers in a country: Earnings (Annual) = 2000 + 1.5 (parents income in Pula) + 12 (work experience in years) + 20 (number of years education) + 5 (number of months of in-service training) $R^2 = 0.52$.

(1) If all other variables remain the same, what should be the additional earnings for an additional year of education for it to be worth undertaking?
(2) Which is the more attractive proposition? to have one additional year of experience on the job or an additional year of education?
(3) Which variable has the strongest influence on earnings - an additional year of formal education or an additional year of in-service training?
(4) What percentage of the variation in earnings has been explained by parents income, work experience, education and training?

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Chapter 8
Theories of labour market
by
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Introduction

Individuals differ in the incomes they receive: this is an indisputably observed phenomenon in different economic systems (Taubman: 1975). In traditional society, higher individual incomes were closely associated with the material wealth one possessed. Consequently, an analysis into the origin of differential incomes will in fact be an analysis of the rise and extent of differential property ownership. On the other hand, in modern or non-traditional forms of society, the relative significance of property incomes has diminished and correspondingly the share of earned incomes has gone up (Denison: 1962; Kuznets:1966). This was mainly because of diversification and expansion of white-collar occupations. Moreover, it was also shown that only a quarter of the variance of income can be attributed to inequalities of property holdings and the remaining three-fourths to inequalities of earnings from jobs (Pen: 1971). Subsequently the focus of analysis was shifted from income to earnings. Again, it was found that there existed differentials in earnings among individuals. Further enquiries brought to light the dominant role played by education in the earnings of a person (Schultz: 1961; Hansen: 1963; Becker: 1964; Psacharapolous: 1973; Taubman: 1975 etc.)

Better educated people earn more than the less educated and this positive association between education and earnings has "near-universal character" (Bhaduri: 1978) and is often characterized as the "most striking finding of modern social science" (Blaug: 1974). However, the mechanisms by which education influences earnings is a less agreed area of enquiry. Spurred on by the different view points, various economists have put forward differing postulations. The attempt of this paper is to critically scrutinize the main trends in the postulations on the relationship between education, employment and earnings.

The plan of the paper is as follows. Section 2 analyses the relationship based on the human capital theory. Section 3 discusses the affective skill development model. Section 4 deals with screening and signalling. The job-competition model is explained in Section 5. Bumping and pooling hypotheses are discussed in Section 6. Section 7 highlights the salient features of the job-ladder model. Labour market segmentation forms the focus of analysis in Section 8. The last Section compares the various explanations and attempts to draw some policy implications for planning education.

2. The cognitive skill development hypothesis

The first theoretical explanation of the education-earnings relationship was provided by the advocates of the human capital theory (Schultz: 1961; Becker: 1964; Mincer: 1974 etc.). According to this theory, education develops cognitive skills which enhance the productivity of and contribution by an individual to total output. Since individuals are paid according to their relative contribution to total output, the more productive will be paid more. And the more productive, in this frame of analysis, will be those who are more educated. Consequently, people are competing to invest more in education. Logically enough, differences in earnings arise because of the differences in the amounts invested in individuals.

According to this postulation, money spent on education is like any investment expenditure and therefore, the demand for education is an investment demand. In fact, it is a derived demand and is a function of the rates of return. The investment in education will continue to the point where the marginal rate of return is equal to the cost of schooling. As in the capital market, this rate is subjected to diminishing returns while cost of education is an increasing function of levels of education.

In general, the human capital model describes output as a function of capital and labour. Since labour is not homogenous because of various levels of education and because the human capital theory assumes that the more educated will contribute more to the total output and wages are paid according to marginal productivity the wage of the more educated will be higher than those with less education.

This particular argument shows that in the human capital framework the distribution of income is mainly affecting only one section of society, i.e. employees. From the employer's point of view there is no significant change: the only difference being what was previously distributed among many would now be distributed among a few. However, such an explanation provides an insight in theory into how earning differentials can arise through investment in education even when the total product does not necessarily increase. Education, in fact, contributes to output both in qualitative and quantitative terms. And, therefore, it will be less realistic to assume that employers are not affected by it. Very often, a change in the composition of the labour force from less educated to the more educated favourably affects the employer because he need not always distribute the due share of the increased returns to the workers.

Models using the human capital framework are invariably based on the marginal productivity theory of distribution which assumes perfect competition. If this assumption is true, then economists need not directly have to analyze productivity as a variable intervening between education and earnings. Provided labour markets function competitively, earnings are a satisfactory measure of productivity and if markets are perfectly competitive then earnings are exact measures of the same (Blaug: 1972). But the more important question is: Are the markets really competitive? If not, what we characterize as earnings from education involves more factors.

Education creates barriers to entry in the labour market. By insisting on educational qualifications for job entry, the job market creates barriers to entry for those who do not possess the required qualifications. Under such circumstances the earnings of the educated as revealed in the market reflect an element of monopoly rent.

"Much of higher earnings is not a return on education but a monopoly rent on (i) the scarcity of the parents who can afford to educate their children well; and (ii) the restrictions on members permitted into a profession in which existing members have a financial interest in maintaining scarcity" (Balogh and Streeten: 1963).

In a strictly human capital framework this monopoly element cannot continue in the long run because competition in the labour market will eventually eliminate it in the process of market clearance. Moreover, employers are also equally or more interested to eliminate it. Very often they adopt a policy of lowering the hiring standards and provide the new recruits with on-the-job training. This will result in a competition between the new entrants and the previously recruited highly educated in similar jobs. And, eventually, this competition will reduce the excess wage which used to accrue to the more educated; and in the long run the wages will be brought down to the initial position where they equal the marginal productivity of the individual.

To sum up according to the human capital theory, the relationship between education and earnings is established through the productivity-increasing role of education; productivity is positively associated with the levels of education. Hence the more educated earn more than their less educated counterparts.

3. The affective skill development argument

According to this postulation, education is an instrument used as a mechanism of social reproduction. Therefore, any analysis of the educational system would remain incomplete if its inter-relationships to other institutions and social relations are ignored. In a typical capitalist economy education performs dual functions:

(a) it plays a role in production; and
(b) it plays a role in social reproduction i.e. perpetuates the existing social order (Bowles and Gintis: 1975). Every individual knowingly or unknowingly performs these functions through his/her schooling.

Educational systems develop many traits which are valued highly by the employers. Therefore, the market value of a worker depends on an array of personal characteristics such as cognitive, affective and ascriptive. The schooling system, through its structural correspondence with the production systems, helps in developing these characteristics. For example, the nature of social relations in education requires the student to function routinely and over long periods which is similar to the role performance in bureaucratically structured enterprises. Even the grading system in classrooms reflects the reward to the development of traits necessary for job performance (Gintis: 1971).

Employers in their hiring practices embark upon certain worker traits and wages are fixed accordingly. Education produces these worker traits not through its curriculum content in the cognitive sense but through the socialization process in the affective sense. However, this does not mean that all the affective traits exhibited by an individual are the result of his/her schooling. The persons graduated from the same school may have different traits. To some extent these traits depend on the social class origins of the individual concerned. In other words, the social class origins are also important elements in determining the personal characteristics that are valued highly by the employers (Bowles: 1972).

To sum up, this postulate, too, supports the basic premise that education enhances earnings. But the mechanism by which this is facilitated differs from that of the human capital model. According to this postulation, schooling affects earnings through a process of socialization that takes place in the schooling process. Schooling develops certain characteristics or traits which are affective in nature. But these affective skills, too, enhance the productivity of the individual.

4. Screening and signalling

Screening (Arrow: 1973) and Signalling (Spence: 1973) theories hypothesize that education does not develop productive capabilities in any individual. A degree or diploma acts as a credential or signal for the employer. It serves more as a measure of performance ability rather than as evidence of acquired skills. A diploma serves as a screening device in the sense that it sorts out individuals of differing abilities and conveys this information to the employers.

Employers have very poor information about the productivity of the employees at the time of hiring. But from past experience, they have very good statistical information of the distribution of productivities of individuals with varying attributes. And education provides this information. Employers depend upon this information to filter out the more productive from the less productive.

According to the filtering hypothesis, those who go for higher education are more talented and relatively more able than those who do not. The role of education is simply to find out or search out who is more talented. In the absence of a screening device like education, there is a possibility of misplacement of the talented with the less talented. Employers will continue to use educational credentials for job selection because it is the easiest and for them the cheapest way of knowing a person's potentials. Individuals are also eager to provide this information because this will enhance their chances of being selected and better rewarded. If the individuals know their ability and the market does not, then all the individuals will be treated alike. In this case those who are with higher ability will be the losers. Therefore, individuals with higher ability are interested in being identified and therefore they are willing to spend money on a device which labels their potentials and which will enable them to "capture their ability rents" (Stiglitz: 1975).

According to the signalling theory, hiring is an investment under conditions of uncertainty. The employer is uncertain about the productive abilities of employees at the time of hiring. So hiring is like purchasing a lottery ticket. At the time of hiring, employers get information regarding two types of attributes -(a) attributes like sex, race etc. which are fixed; and attributes like education which are manipulative. Given the combination of "signals and indices" (Spence: 1973), the employers may be able to distinguish individuals, based on their past experience regarding the productive capacities of employees with certain attributes.

Signalling theory differs from the screening hypothesis as regards feedback from the responses of employers. According to Arrow, allocative efficiency need not be achieved through screening because it needs information regarding marginal productivities of individuals and in a complex production process the employer may not obtain it. The signalling theory, on the other hand, considers that there is always information feedback to employers and the employer's beliefs are readjusted accordingly; so are wages. The "upward filtration" model (Taubman and Wales: 1974) indirectly supports this claim. Since firms do not know the productivities at the time of hiring, those who are in comparable positions are paid equally and later they introduce performance-based promotions and income on accomplishment.

Empirical testing of the screening hypothesis is, perhaps, more difficult than its theoretical differentiation with the human capital theory. Studies (Taubman and Wales: 1974; Layard and Psacharapoulos: 1974; Haspel: 1978 etc.) show that screening exists; but the results cannot tell us whether productivity increments are due to education or to the inherent talents an individual possesses.

To sum up, these two hypotheses support the basic postulation that there exists a positive correlation between education and earnings. But they do not subscribe to the view that higher earnings are caused by any skills developed by the educational system. Higher education does not develop any skills. It only identifies or screens out the better talented and gives this information to the employers. Since the higher educated, according to these hypotheses, are intrinsically more talented, employers prefer to hire them and higher wages are paid accordingly. Therefore, the higher educated earn more because they are intrinsically more talented and thereby believed to be more productive.

5. The job-competition model

The job-competition model is an attempt to formalize the empirically observed phenomenon that despite education being more equally distributed income is unequally distributed (Thurow: 1974). In this model "instead of competing against each other based on wages, individuals compete for jobs based on their relative costs of being trained" (Thurow: 1975).

The function of education is not to confer skills but to certify trainability and to confer a certain status by virtue of certification. Jobs and higher incomes are then distributed on the basis of this certified status. According to this model skills are picked up on the job. The function of labour markets is to match the trainable individuals with training ladders. Employers are looking for the best matches so as to reduce the training costs. Therefore, trainability and training costs become important determinants of recruitment policy.

Individual jobs and the related incomes are determined by two sets of factors:

(a) one set of factors that determine their position in the queue; and
(b)another set of factors that determine their job opportunities in the economy.

One's position in the queue depends on the structure of the national labour queue. This national labour queue depends on three factors:

(i) The background characteristics like education, sex, race etc.;
(ii) employer's ranking of different background characteristics; and
(iii) distribution within each background characteristic.

Since education is an important background characteristic used for screening individuals in the labour market, one's position in the labour queue to a great extent depends on it. But this does not necessarily mean that education determines the actual distribution of income, because it is also a function of job opportunities. But if the differences among individuals are minimal they may be grouped together and therefore their expected values will always be around the group's expected value. In other words, groups have expected values in the labour market and not the individuals.

In the labour market employers rank their workers on a continuum from the best to the least potential trainees on the basis of the estimated potential training costs. If there is perfect correlation between the background characteristics and employer's ranking, then each group's position in the labour queue will be the same as that of their background characteristics. Under such circumstances background characteristics themselves can be seen as a proxy to determine the group's position in the labour queue.

The distribution of job opportunities in the economy is governed by:

(a) character of technical progress;
(b) sociology of wage determination; and
(c) the distribution of training costs.

Education can enhance the chances of getting a job because it reduces the training costs. After the initial job entry one gets skills through on-the-job training. After receiving this training, perhaps, the initially equal workers would have unequal skills and productivities and thereby unequal incomes.

A close look at the model will reveal that education is important in determining earnings of an individual or groups at least for two reasons: (a) employers are interested in education because it provides them with information regarding the probable training costs they have to incur; and (b) prospective employees are interested in education because their position in the labour queue is determined to a great extent on the basis of background characteristics among which education is an important one. These two factors will influence the demand for education and it will continue to grow.

To sum up, the emphasis in this model is on job, rather than on wage, competition. Labour markets do not mediate between the skill requirement and the skilled. Skills are picked up on-the-job. What employers are interested in is to reduce the training costs. So they are looking for the trainability of the individual. Education is an important background characteristic which is indirectly used as measure of trainability. Therefore, education helps in job entry. However, the actual earnings depend on the skills that one picks up on the job.

6. Earnings under conditions of bumping and pooling

This model focuses on the hiring practices as an intervening variable in determining the education-earnings relationship, especially in the case of developing countries. In less developed countries wage rates are rigid and wages are fixed to jobs rather than to the educational levels of the employees.

According to the simplified version of the model there are two groups of workers - educated and uneducated. Similarly there are two types of jobs - skilled and unskilled. The unskilled jobs are divided into two - urban unskilled and agricultural unskilled in the rural areas. In the wage system urban skilled workers get the highest followed by urban unskilled and agricultural workers in the rural areas (Fields: 1974).

Education is productive and therefore employers hire persons with higher levels of education in a preferential order. The job seekers, on the other hand, try to maximize their incomes. When the number of jobs is higher than or equal to the number of educated persons, the functioning of the labour market is smooth and everybody gets a wage equal to his/her relative contribution to the national product. If the educated persons outnumber the vacancies in the skilled market, then this surplus educated labour can have two options before them:

(i) to go to the next best employment, i.e. urban unskilled jobs; and
(ii) to remain unemployed but look for a skilled job, since wages are less in the unskilled sector.

According to the bumping model, the employers follow a policy of preferential hiring practice and therefore the educated moves to the next lower level market i.e. the urban unskilled jobs. If unemployment of the educated continues to increase and employers continue to follow the same policy of preferential hiring practice then eventually the jobs in the urban unskilled job market will be filled by the educated. This will force the uneducated urban workers to seek jobs elsewhere. This process of driving out of the uneducated workers from urban unskilled jobs is called "Bumping out process". The options of those who are bumped out of the urban unskilled jobs are very limited. When they fail to find a job in the urban sector, they have to seek employment in the rural areas. This, again, will eventually displace the rural unskilled workers from their job. Thus one can see that the better skilled drive out or bump out the less educated from better paid jobs.

The pooling model is similar to the bumping model in many respects. It does not assume a preferential hiring practice based on education. Education is considered neither a hindrance nor a help to get jobs. In unskilled markets educated and uneducated job seekers have equal chances of being selected or rejected. Since wage differentials exist among the labour markets, educated people will be less interested to obtain unskilled jobs because such a shift will not increase their probabilities of employment. Therefore, educated job seekers would like to stick to the urban skilled jobs. Only under extreme differences in the levels of unemployment between the two labour markets will they be willing to come to the unskilled job markets.

According to the two versions of the theory, there is a difference between educated persons employed in skilled and unskilled job markets. In the bumping model those who choose to enter unskilled labour markets and get the on-going wages consider themselves to be fully employed whereas in the pooling model the same group considers themselves to be partially employed. So the present value of income that one expects in unskilled job market is lower. This implies that in the pooling model the opportunity cost of educated unemployed in the skilled market is lower than that in the bumping model, i.e. the educated in the pooling model may be able to tolerate prolonged unemployment better than they can do in the bumping model.

The private present value of earnings from a particular level of education is the motivating factor to obtain more education, and if demand for education is to be reduced then the government has to bring down the present value of the future earnings of the educated. This can be done in different ways:

(a) bring down the wage differentials between the skilled and unskilled in the labour market or change the tax structure by making it more progressive;
(b) change the hiring practice whereby a preferential hiring practice on the basis of education is not followed; and
(c) charge the full cost of education to students by providing them with loans.

To sum up, according to this model hiring practices followed by the employers play a dominant role in the determination of earnings of an individual. If preferential hiring practices are followed there may be absolute differences in earnings but the relative differences in earnings of the groups with different levels of education may not change substantially. If the practice in hiring is not preferential then both the relative and absolute differences between persons with the same and differential levels of education will continue.

7. Earnings in a job-ladder model

This model is very similar to the bumping model and emphasizes the primary function of education as a mechanism to improve one's own competitiveness in the labour market. According to the model, the economy is divided into three sectors. Sector I employs only educated labour; sector II employs educated labour as teachers and sector III employs both educated and uneducated workers at identical wage rates. Wages are rigid in sectors I and II. The excess supply of labour from the two sectors spills over to the other sector i.e. sector III (Bhagawati and Srinivasan: 1977).

In its pure form, this model assumes that sector I employs only educated labour. Sector III, on the other hand, needs only uneducated labour. Because of unemployment, there will be a spillover of the educated labour from other sectors to sector III. Since wages of the educated and uneducated are the same in this sector, the employers are happy to have the educated. But when fairness in hiring practice is introduced, those who have more education benefit more because, as in the case of preferential hiring practices, higher levels of education enhance competitiveness and thereby employment chances of the educated. So individual demand for education will continue to grow.

To sum up, the "fairness in hiring" principle forms the basis of the theory. Fairness in hiring exists because of the existence of job ladders. If there are no job ladders then the fairness in hiring principle becomes redundant. Therefore, the best solution is to eliminate job ladders and to restore fully flexibility of wages. The second best solution will be to eliminate the use of educational attainment as a criterion in hiring practices and introduce a lottery system for all qualified and over-qualified applicants.

8. Earnings in a segmented labour market

The labour market segmentation hypothesis focuses on the socio-institutional factors influencing jobs and wages. Based on the historical perspective on the evolution of the employment process and the reactions of the employers towards it, the theory argues that segmentation of labour markets is the result of the deliberate attempt by the employers to fight against the progressive homogenization and thereby the collective bargaining power of the workers. However, there are different versions to this theory based on the identification of factors chiefly responsible for the process of segmentation. Some of them emphasize social control factors (Reich et. al: 1973 and Edwards et.al.: 1975), others technological factors (Piore: 1975) and the basic contradiction in social structures (Carnoy: 1980). Though there are differences in the emphasis added, all of these different versions have a common framework.

According to the segmentation theory, the labour market is divided into two (primary and secondary) sectors. The primary sector is characterized by high technology, high wages and stable employment conditions, whereas the secondary sector is constituted of low technology, low wages and instability of employment. Some versions of the theory further divide the primary sector into two: upper and lower tiers (Piore: 1975). Jobs in the upper tier involve decision-making abilities and those in the lower tier are constituted of routine tasks involving less decision making. Internal labour markets (Doringer and Piore: 1971) and promotion possibilities exist in the primary sector and are relatively absent in the secondary sector. Because of the low wages, instability of employment and absence of mobility, labour turnover is high in the secondary sector.

In the primary labour market, education becomes more important at the "ports of entry" and workers not having the required qualification for particular entry level jobs are excluded from the primary sector jobs and promotion ladders therein (Reich et.al.: 1973). In the upper tier of the primary sector employers are looking for workers with "ability to do what one would have been told without being told" (Carnoy and Rumberger: 1976); and in the lower tier traits like dependability, rules orientation and responsiveness to authority are sought for. The jobs in the secondary sector require minimum or no skills. Some studies (Maxumdar and Ahmed: 1978) have shown that education counts more in the primary labour markets and experience in the secondary segments.

The primary concern of the hypothesis is that earnings in any of the segments of the market are based neither on education nor on experience. The wages are related to and based on exogenous factors like race, sex etc. In fact the segmentation theory talks about the institutional structure of wages (Piore: 1973) rather than wages per se. In this frame of analysis, education is not a direct determinant variable influencing earnings. However, the theory does not repudiate the correlation between education, experience and earnings though it does not venture any causative arguments in this respect.

According to the theory, the correlation between education, experience and earnings does not establish that more education and experience contribute to higher productivity. So the link between education and earnings is not through productivity but through socio-institutional factors. Since incomes are attached to jobs rather than to individuals, job entry becomes crucial in determining one's wages. For job entry education is unimportant in the secondary sector. However, education is a relatively significant factor in the primary markets. This is because the educated can better meet "the hierarchical needs and customs"

(Carnoy and Rumberger: 1976). This again is due to the fact that the better educated come from well-to-do families which are in line with the organisational design of the enterprises. Therefore, the theory argues that whether educated or not it is the socio-economic background which influences earnings. Since there is a correlation between socio-economic background and educational levels of the employees (Bowles: 1972) there can be a correlation between education and earnings. But to derive any causative relation between education and earnings based on such evidence will not be justified.

To sum up, this theory also agrees that there can be positive correlation between education and earnings. But it does not agree that higher earnings are due to higher education. On the other hand, it argues that in the present social order those who get higher education and thereby higher earnings are people from a higher socio-economic background. So the educational factor in determining earnings is more of an incidental nature and the real correlation or relationship is between earnings and the socio-institutional factors.

9. Conflicting implications of the diverging view points

In the earlier sections we have discussed conflicting explanations for the observed positive association between education and earnings. Based on the differences in the identification of intervening variables that facilitates such a positive correlation, the postulations can be grouped into four:

(a) productivity as the intervening variable;
(b) trainability as the intervening variable;
(c) hiring practices as the intervening variable; and
(d) socio-institutional factors as the intervening variable.

Human capital, screening and signalling hypotheses, in one form or the other, identify productivity as the variable intervening between education and earnings. All these three hypotheses agree with the fact that the higher educated are more productive. But they do disagree in explaining why the educated are more productive. To the human capitalists education develops cognitive skills which enhance productivity. Screening and signalling hypotheses, on the other hand, argue that higher educated are inherently more talented and hence more productive. To them, education screens out these talented individuals and signals this information to the employers, i.e. the role of education is productivity identification rather than productivity addition. Perhaps, the difference is that in human capital the concept of productivity enters through the front door whereas in the other two hypotheses it enters through the back door (Varghese: 1982). However, these two roles of education need not be contradictory to each other. In fact, Arrow argues that the filtering role of education, from the private point of view, is synonymous with the productivity adding role.

Implications of these hypotheses for educational policy formulations vary. To the human capitalists, education contributes to national output and individual earnings. Therefore, they encourage public and private expenditure on education. On the other hand, screening and signalling hypotheses argue that the total national product will not be enhanced because of more educated people. Accordingly the contribution of education to national product will be zero if educational costs are borne by individuals and negative if educational subsidies exist (Blaug: 1972). Therefore, these hypotheses discourage public spending on education. However, they do not discourage private expenditure on education because through education the more talented are identified and are paid accordingly.

The job-competition model identifies trainability as the important factor influencing job selection and thereby earnings. According to this model, productivity is an attribute of jobs and not of individuals. Skills do not exist in the labour market; they are picked up on the job. What the employer is interested in at the time of hiring is to reduce the probable training costs. Since the employer does not have information regarding specific training costs of specific individuals he/she uses education as one of the important background characteristics or proxy variable under the assumption that the more educated one is the less the training costs to be incurred on him/her. This gives the educated an opportunity to get better jobs and higher earnings.

This model encourages private and public spending on education for different reasons. Employers are interested in education because it provides them with the information regarding the probable training costs. Society is interested in education because it helps in altering the distribution of income. Individuals are interested in education because their position in the labour queue to a great extent is based on the level of education. But the individuals spend on education not as an investment but treat it as a defensive expenditure "necessary to protect one's market share" (Thurow: 1974).

Bumping and job-ladder models emphasize hiring practices as an important factor in determining individual earnings. Both models agree that the educated are more productive and in this sense they are in line with the human capital theory. But unlike the human capital theory, they argue that the jobs the educated generally hold in less developed countries are such that their potential productivities can not be realized. This is because of the existence of unemployment and the hiring practice followed by the employers. During periods of unemployment the employer follows a policy of preferential hiring practice based on educational qualifications. This practice is considered to be fair because the educated have spent more to acquire higher levels of education to increase their competitiveness in the job market. Under this hiring practice the more educated receive better jobs and higher earnings. The higher educated earn more not because of their productivity but because they were given preference in hiring. Since the educated are forced to jobs requiring less education, their contribution to the total product is not different from what the less educated would have contributed.

According to this theory public spending on education is a waste and therefore argues against public expenditure on higher education by the less developed countries. On the other hand, private spending becomes essential because of the preferential hiring practice. People spend on education not because they like it but because if X does not obtain higher education Y will and eventually it will reduce the market value of X. Hence X is forced to obtain higher levels of education.

The affective (Bowles and Gintis: 1975) and segmentation models emphasize the socio-institutional factors influencing education and earnings. To the proponents of the affective skill development model education is an instrument of social reproduction and the role of education is to inculcate certain affective traits through the structural correspondence between education and the production sectors. And these traits are valued highly by employers. So the educated are hired and paid higher wages. In a typical capitalist society the institutional factors are strong enough to restrict the entry of less privileged from the educational and employment sectors and therefore, the poor are deprived of better education and higher paid jobs. According to the segmentation theory the institutional barriers are a necessary condition for the smooth functioning of the capitalist system. So the capitalists are interested to maintain and increase the role of institutional barriers. Segmentation in the labour market is a reflection of this phenomenon. The capitalists try to reinforce the existing segmentation in the labour market because it is a very useful instrument in fighting against the organized labour force. And they use education as one of the important instruments of dividing the labour force. Those in the primary sector are paid higher salaries and education is made an essential requisite to enter to these segments. Since educational opportunities are unequally distributed, the better educated will invariably be from better socio-economic backgrounds. Therefore, by insisting on educational qualifications they, in fact, recruit people from better socio-economic backgrounds. The employers prefer this group because, by virtue of their social position, they will be more in agreement with and hence more useful to the employers in carrying out their designs. Here one can notice that the educated are recruited not because of their education but because of socio-economic characteristics. Education is one factor or perhaps an incidental factor influencing earnings.

According to these hypotheses, a marginal or substantial increase in educational expenditures by the public authorities or by the private individuals is not going to have any effect on the existing situation. What is needed is to change the very socio-institutional factors which reinforce the segmented nature of the labour market. Therefore, these hypotheses argue for the restructuring of the institutions which result in bringing about inequities in society. This calls for radical changes in the philosophy of the system in general and of the educational system in particular.

From the discussions in this paper, one can notice that each of the postulations provides a partial explanation for the observed positive association between education and earnings. However, the direction of the change in emphasis is worth noting. From human capital to the segmentation theory, there is a gradual shift in emphasis from individuals to groups to society at large. To the human capitalists, education is a powerful instrument to bring about equity in the distribution of income; to the segmentationists education can only reproduce inequities when social inequities exist. So the shift in emphasis is from an isolated analysis of education as an active agent of change to the marginal role of education in a given society. Education is treated only as one of the supporting instruments in an economy. This shift in emphasis brings to light the inter-dependent role of education and thereby the necessity of planning for education at its interface with a given social context.

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Chapter 9

Tracer studies to relate education with employment for development of human resources

by Bikas C. Sanyal

1. Introduction

Research on the relationship between education and employment has received significant attention in recent years among educational decision-makers, planners and administrators. It is now well recognized that simple quantitative forecasts of manpower needs cannot provide precise enough direction for the development of the education system. The relationship between education and employment can no longer be based on such forecasting models alone. The fact that there are aspects of this relationship which remain unknown makes it more complex. Researchers have to look into this unknown area, particularly at a time when the problem of unemployment among youth is becoming more and more critical. Overall open unemployment has been increasing at a very fast rate in almost all countries, except those where the economic recession has not been serious. However,the number of such countries are very few.

The problem in magnitude started increasing in the seventies. Although economic stagnation was believed to be the main cause behind this problem, it was also felt that many other factors were contributing to such a situation. These were sociological, psychological, administrative and organizational factors, which researchers had to identify in order to provide new tools for decision-makers to remedy this problem. However, such research has not always followed the same conceptual framework; different points of view about the relationship between education and employment have been the basis for different types of research. At one extreme, there is the point of view that the relationship between education and employment is artificially imposed by the society and vested interest plays a dominant role to keep a 'status quo' in such a relationship, thus perpetuating social hierarchy, discrimination and segmentation in the society. At the other extreme, it is held that educational systems could be reformed to provide skills to meet the social and economic development needs, as well as to meet individual expectations for upward social mobility, without going into the socio-psychological complexity of the relationship, reducing the analysis to the traditional quantitative forecasting exercises.

In what follows, we attempt to take into account the influence of the social structure on the development of education in relation to employment, based on the belief that reform measures if properly planned and implemented can reduce the problem of unemployment. A combination of two approaches has been utilized, as described in the following sections.

2. The conceptual framework of the relationship

It is argued that interdependence between educational development and the overall socio-economic development of a country in general, and development of employment in particular, calls for an analysis of the resource potential in natural, physical and human categories. To develop each region in a balanced way, the development strategy of a country should take account of whatever natural resource potential is available in that region. The process of exploitation and the choice of technology will be determined inter alia by natural resource potential. The exploitation of these resources needs skills which must be provided by the education system. The way in which natural resources are exploited, therefore, influences the educational development strategy in structure and content. It is also dependent on the available and potential physical resources such as building equipment, transportation and communication facilities. Development of these physical resources depends in turn on the development of education and vice versa. An analysis of physical resources potential therefore becomes an important task in ascertaining the role of ducation in the overall development strategy of a country.

In the analysis of the development of human resources, traditions, customs and beliefs cherished by the people cannot be ignored. Demographic changes influence the human resource potential as well. Education, for that matter higher education, has to be planned in such a way s to develop this human resource potential in order to respond to the needs of the social and economic development of the country, while considering the expectations and attitudes of the people. An analysis of human resource development therefore becomes imperative in the overall analysis of the relationship between education and employment.

The conditions of work, recruitment and promotion policy of the employment market influence the type of qualification that an employee would have. The full employment policy, on the one hand, has to guarantee a job for every individual. In countries where this policy does not prevail, individual initiative is necessary for obtaining employment. Therefore, the development of human resources becomes dependent on the operation of the labour market and the prevailing employment policy. The policy of human resource development for economic and social needs calls for an analysis of the skills needed for the various activities of the economy. The output of the education system, by type of skills taught, has to be known for proper utilization of the human resources it generates. Before the education system can be planned with respect to intake, content and structure, it is only logical that demands for such skills in quantitative terms should be estimated beforehand to whatever extent possible. These estimates of demand, which traditionally have been called manpower demand, but in our conception are broader than than because of the consideration of the qualitative aspects, are susceptible to inaccuracy due to economic uncertainties and the changing nature of the perceptions, attitudes and expectations of the different segments of the society. However, some guidance is needed as to the direction that the development of education in general, and higher education in particular, should take in quantitative terms to cater for the future needs for skills so as to avoid unemployment, underemployment, or shortage of skilled human resources.

It is considered that these estimates, if properly prepared, can provide such guidance. These quantitative estimates of needs for skills can be checked with the actual values to identify the degree of inaccuracy and to form a checklist of missing parameters and variables. They re also useful for setting the foundation of the strategy for the development of the structure and organization of the education system.

It is assumed that where higher and vocational education is concerned the estimates are easier to make, because of the increased degree of correspondence between the skills imparted in the education system and the skills needed on the job, than for other types of education. Having regard to the problems of estimating future needs for highly qualified manpower, an analysis of the matching between the quantity of trained people and the quality of the training content demanded by the economy and responsiveness of the institutions of higher education becomes particularly useful. This analysis of matching brings out the shortcomings of the education system, not only quantitatively but also qualitatively. A careful diagnosis of the education system forms the basis of any future strategy for the higher education system and also provides a yardstick for achievements in restructuring the social system through change in the educational system, and illuminates the problems encountered in achieving the targets of socialization and equality of opportunities in the world of work. These problems may be seen in the various education ‘,paths’ of different population groups, which result in the different working opportunities in the labour market.

This relationship is demonstrated in Figure 1.

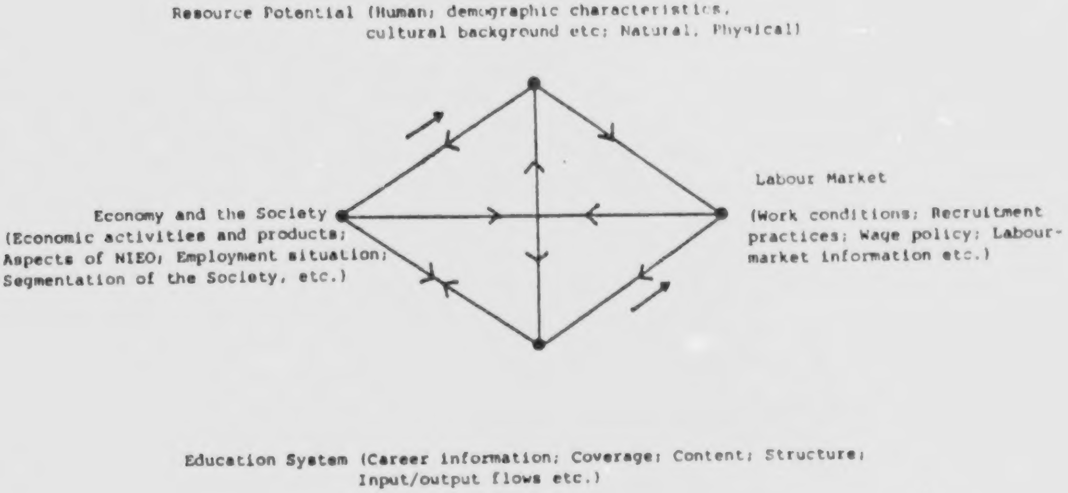
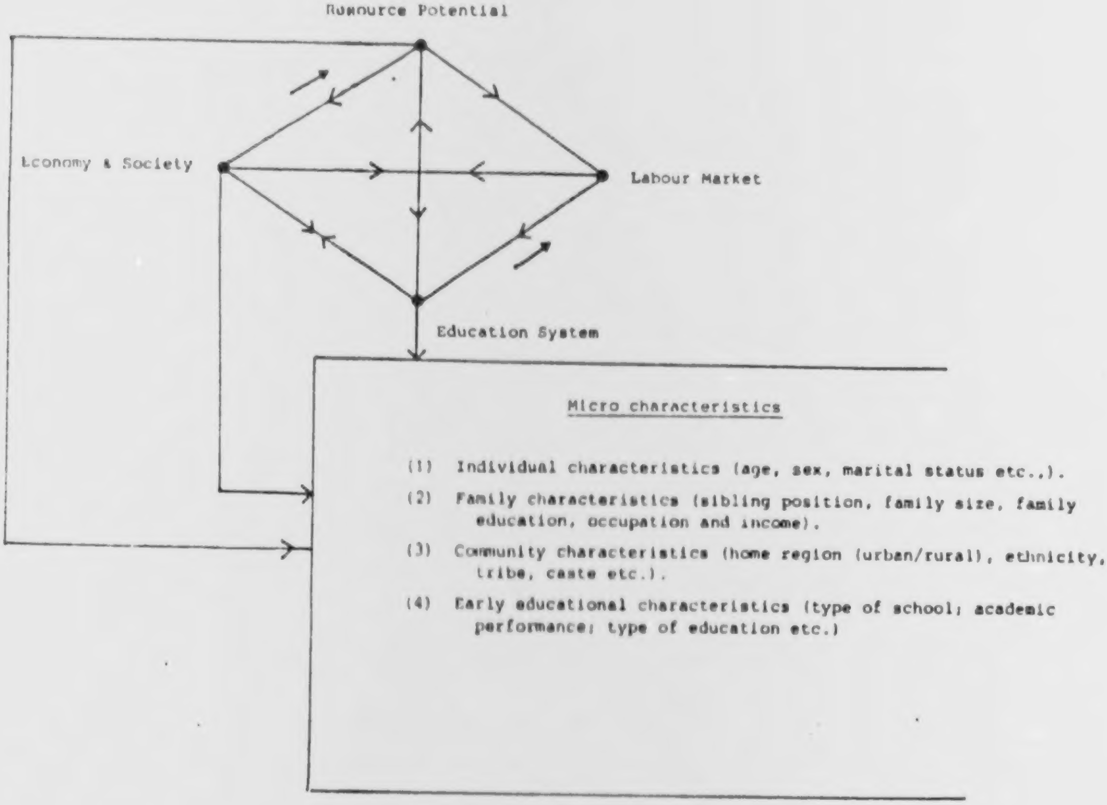

Resource Potential (Human; demographic characteristics, cultural background etc; Natural, Physical)
Labour Market
(Work conditions; Recruitment practices; Wage policy; Labour-market information etc.)
Economy and the Society
(Economic activities and products; Aspects of NIEO; Employment situation; Segmentation of the Society, etc.)
Education System (Career information; Coverage; Content; Structure; Input/output flows etc.)

Figure 1: Macro aspects

What is more important however are the micro aspects of the relationship. In the analysis of the relationship between education and employment, we are concerned with individual human beings and individual enterprises. Their background, attitudes and expectations play an important role in this relationship. What goes on in the labour market is a reflection of the social set-up including the educational system. We believe that the economy and the society, the human resource potential of the country and the education system as it is, influence the behaviour, attitudes and expectations of the individuals, their families, their community, and their educational history (see Figure 2). These factors again influence directly the expectations of each individual in respect of his or her social role, as does the operation of the labour market through its selection criteria, recruitment practices, labour market information system, etc. But the occupational expectations are also indirectly influenced by resource potential, economy and the society and the educational system through the individual characteristics (sibling position, family size, parents/guardians' occupation, education and income), the community characteristics (home region, religion, ethnicity, tribe) and the early educational history (type of school, type of education, academic performance, etc.) (see Figure 3).



Micro characteristics

(1) Individual characteristics (age, sex, marital status etc.,).

(2) Family characteristics (sibling position, family size, family education, occupation and income).

(3) Community characteristics (home region (urban/rural), ethnicity, tribe, caste etc.).

(4) Early educational characteristics (type of school; academic performance; type of education etc.)

Figure 2: Macro-micro inter-relation

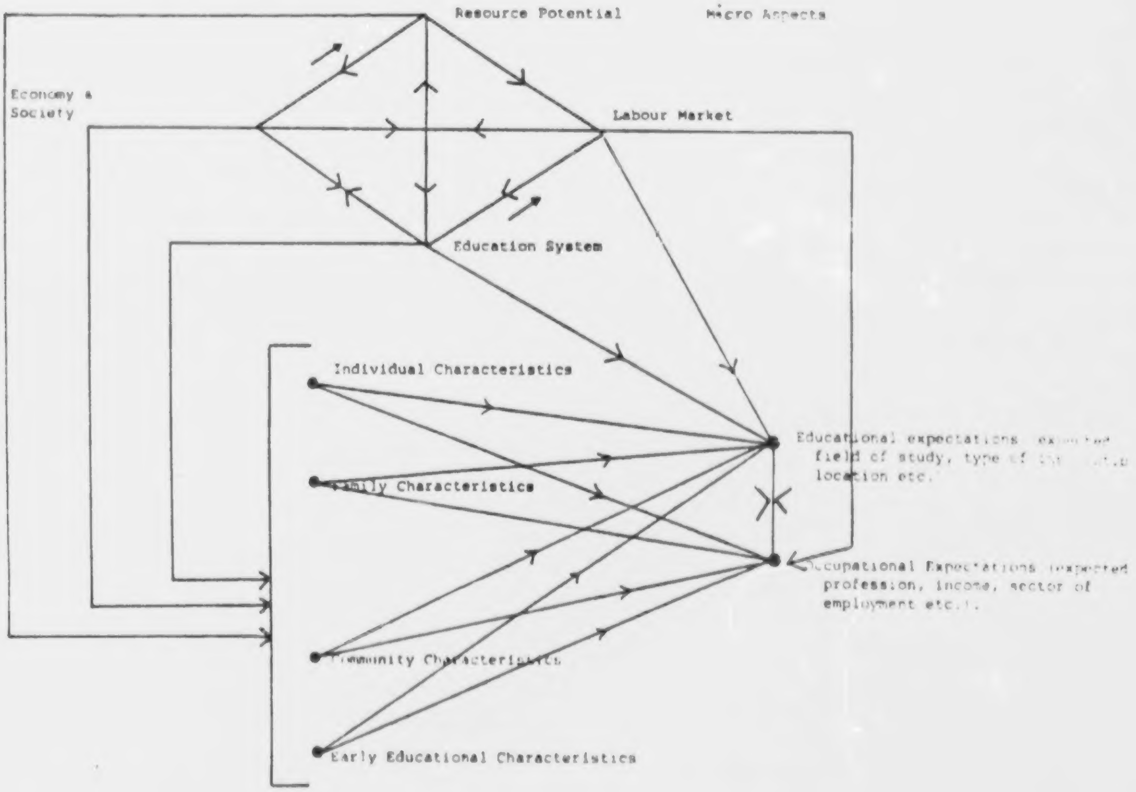

Resource Potential
Micro Aspects
Economy & Society
Labour Market
Education System
Individual Characteristics
Family Characteristics
Community Characteristics
Early Educational Characteristics
Educational expectations (expected field of study, type of institution, location etc.)
Occupational Expectations (expected profession, income, sector of employment etc.).

Figure 3: Occupational expectations derived from the macro-micro interface

Similarly, motivation in respect of education is generated directly by the motivation in respect of occupation, functioning of the education system, the individual, family, community and early educational characteristics, and indirectly by the resource potential, economy and the society, and the education system through the individual, family, community and early educational characteristics. It is considered that if a society is to be democratized, the education system, the economy and the society have to give emphasis on changing the micro characteristics so as to generate egalitarian occupational and educational expectations which would then lead to egalitarian educational and occupational careers of individuals.

The educational career of the individual is directly influenced by the educational expectations, the education system, the individual, family, community and early educational characteristics, and indirectly by the occupational expectations, the economy and the society, and the resource potential through the micro characteristics (see Figure 4). The items of educational career are type of institution attended and its location, field of study pursued, academic performance, change of subject during the course of studies, etc.

Figure 4.

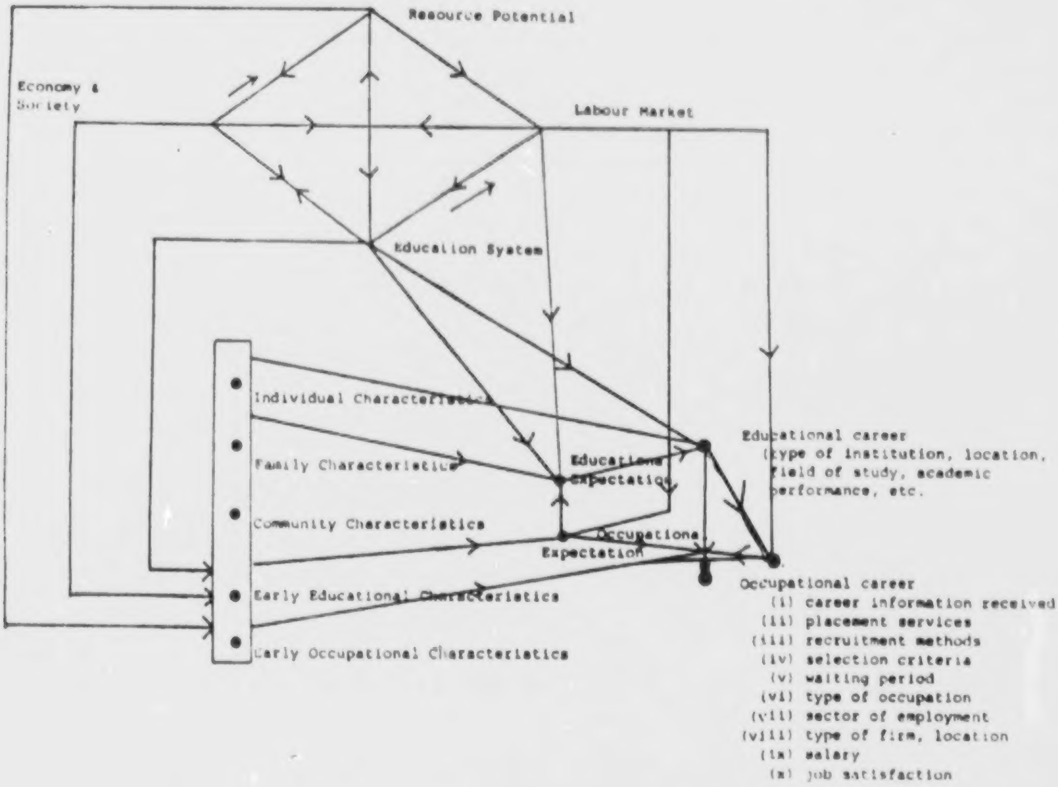


Figure 4: Occupational career derived from the macro-micro interface

The occupational career is dependent directly upon the educational career, the labour market situation, the occupational expectations, and individual, family, community, early educational and occupational characteristics, and indirectly upon the economy and the society, resource potential and the education system. The items of occupational career are career information received, placement services used, recruitment methods and selection criteria used, waiting period to obtain a job, type of post held, type of firm, location, salary, satisfaction on the job, and utilization of training/education on the job (see Figure 4). Some of these items are also in the domain of the employers which need to be checked with them to find whether the experience of the graduates matches with the employers' perceptions.

The basic thrust of our approach is that the education system as an important instrument for human resource development can change the characteristics of the individuals, families and the community, so as to make the transition from institutions of education to work smoother.

3. Data needs

A conceptual framework as described above requires a lot of data and information on the resource potential, economy and social structure, education system, and on the labour market. A list of such data needs is given in Table 1 along with the possible sources. The analysis of the individual, family, community, early educational and occupational characteristics, occupational and educational expectations, educational and occupational career actually held by the individual also need considerable data, which are not usually available in published documents. Instruments have to be designed to collect such data. Three types of instruments are designed in the form of questionnaires: one for the students, one for the graduates (separately for employed and unemployed if it is feasible to cover them), and one for the employers. The data needs for the micro aspects of the relationship between education and employment are given in Table 2 (for students and graduates) and Table 3 (for employers). The data on the employers are needed for comparing the perceptions of the employers with the experiences of the graduates, as well as for identifying the relationship between education and employment as perceived by the employers.[1] The drawing up of the necessary questionnaires to collect the data will be discussed later in the course.

4. Collection of data

Representative samples are drawn from the student, graduate and employer population based on the random sampling technique; where such a technique fails, purposive sampling to cater for the special needs and scope of the study is adopted. Detailed methods are given in Reference 1.

5. Analysis of the data

A list of hypotheses is prepared to verify the conceptual framework described above and to derive policy measures. These are tested by standard statistical analysis, as described in the session on statistical techniques.

6. Results

As stated before, results of such research are to be related to the specific socio-economic context of the country. Implications for planning of education related to employment have been derived separately for each country studied (see list of publications on the subject attached).

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[1] In some case, data have been collected from academic staff to better understand the relationship (e.g. Sri Lanka).

Table 1: Data needs for macro aspects of the relationship between higher education and employment

Items	Required information/statistics	Sources
1. Resource potential :		
(a) Human :	Population characteristics by region, social groups, age group and sex; cultural background: traditions, customs; working population; labour force participation by social groups, age and sex; educational participation by social groups, age and sex; emigration and immigration.	Census, sample surveys, historical and social studies on the country; labour force and educational statistical yearbooks of the country.
(b) Natural and physical :	Nature resource reserves: underground, on the surface and underwater; water and land transport; climatic conditions; flora and fauna; physical infrastructure: buildings, equipment and other facilities.	Geological, agricultural and economic surveys of government, non-government and international agencies.
2. Economy and the society :	The role of the modern and the traditional sector; the industrial origin of the gross domestic product; level of saving, income per capita; the characteristics of the new international economic order (NIEO), namely terms of trade, transfer of technology and division of labour, the role of external operators in the national economy; social stratification; employment situation.	Economic surveys and reports of the country prepared by national and international agencies, sociological studies, studies on political economy, employment reports, etc.
3. Labour market :	Selection criteria, recruitment and promotion practices, wage policy, labour market information, etc; the traditional labour market; the rural labour force.	Statistics on employment and earnings; reports of recruitment committees, salary commissions; statistics on labour force; census and sample surveys.
4. Education system :	Statistics on enrolment by type and level of education (past and present), by sex, region and social groups; statistics on physical facilities, teachers and budget, flow rates by year of study, level and type of education; availability of career information; information on content and structure of the education system in school and out of school; coverage of education; internal and external efficiency of the system.	Ministry of Education, Ministry of Finance, and Ministry of Planning; other reports and national and international level.

Table 2: Data needs for micro aspects of the relationship between higher education and employment: the students and the graduates

Items	Statistics/information	Sources
1. Individual characteristics	Age, sex, marital status	
2. Family characteristics	Sibling position, family size; education, occupation and income of parents/guardians.	
3. Community characteristics	Home region (urban/rural), ethnicity, religion, tribe, educational opportunity in the community, etc.	
4. Early educational characteristics	Type of school, location, type and level of education, academic performance, financing; other training activities.	Sample surveys conducted with specially designed questionnaires
5. Early occupational history	Whether worked as a student; if yes, nature and earnings; whether worked breaking studies; if yes, nature and earnings.	
6. Occupational expectations	Type of occupation expected, type of post, sector of employment, type of firm; expected waiting period; expected salary, motivational factors for working in rural area, expected selection criteria, placement services and recruitment methods.	
7. Educational expectations	Type of specialization desired; type of institution, location, type of performance expected; type of educational career information received.	
8. Educational career	Career guidance, admission criteria, reasons for the type of specialization pursued, type of institution attended, location, academic performance, changes if any in field of study during educational career; role of career information; relevance of education received.	Sample surveys conducted with specially designed questionnaires
9. Occupational career(1)	Career information, placement services, selection criteria, recruitment methods, waiting period, type of occupation, education/occupation match, sector of employment, type of firm, location, job satisfaction, motivational factors for work in rural area; reasons for delay in obtaining a job.	

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(1) For graduates only. The statistics relate to the employed graduates; information on unemployed graduates is very useful if a survey can be conducted; only the first and last elements, namely career information and causes for remaining unemployed have to be included.

Table 3: Data needs for micro aspects of the relationship between higher education and employment: the employers' perceptions

Item	Information/statistics	Sources
1. Characteristics of employers	Date of establishment, type of control, size, industrial group, nature of products and services.	Sample survey of employers conducted with specially designed questionnaire
2. Employment characteristics	Criteria for selection, method of recruitment, availability of job description mechanism, number and type of graduates employed, estimates of needs for graduates in the future, salary structure.	
3. Relationship with higher education institutions	Relevance of higher education programmes for job performance; organizational mechanism for in-service and on-the-job training; methods of co-operation with the institutions of higher education; best methods of organizing educational programmes related to the needs of the world of work.	

Chapter 10

Tracer studies in Botswana: A State-of-the-Art Review (Including practical exercises)

by Ulla Kann and Bagele Chilisa

I. Introduction

Ever since independence the planning and development of Botswana's educational system has been closely linked to the need for manpower in the formal sector. The first ten years after independence it was the manpower demands of the central government that dominated. Lately, however, the needs of parastatals, local government and the private sector have increasingly been taken into consideration.

The official view has been that there is, or should be, a close link between education and employment (in the formal sector). I would argue that it is not only government, that holds this view, but parents and children also to a great extent have come to expect that education should carry with it the benefit of future employment (in the formal sector).

The extent to which students manage to become gainfully employed is frequently used as a measure of the external efficiency of the educational system. With the close link planned between education and employment in Botswana it is not surprising that substantial work has gone into attempts in establishing the external efficiency of the educational system. Such work has often taken the form of tracer studies.

II. Tracer studies in Botswana

A number of tracer studies have been carried out during the last ten years. This paper is an update of a 'State-of-the-Art Review of Tracer Studies in Botswana' (Chilisa, 1988 and Kann et al., 1988). For a more elaborate discussion the reader is referred to Chilisa, op. cit.).

The literature on tracer studies in Botswana falls roughly into four categories (Chilisa, op. cit.). In the *first category* are studies that have been conducted at *Government level.* Within this category are studies by the Central Statistics Office at the request of the Ministry of Education (CSO 1979a, 1979b, 1981, 1987). These covered various levels of the formal education system as well as Brigade leavers.

The main objective of almost all these studies has been to establish the destiny of school leavers, e.g. to establish the typical employment attached to various levels and kinds of education, and to various levels of educational achievement. Analysis has been simple and straight-forward, limited to frequencies and cross-tabulations, even leaving out the gender-variable, so important in the relation between education and employment.

The *second category* of tracer studies is the kind carried out by *educational institutions* as part of evaluation of their own programmes. The Auto Trades Training School (ATTS), for example, conducts annual tracer studies of its leavers. These are intended to gauge the relevance of the training to the job market and constitute an important feedback to improving and programming the courses offered. They were initiated by the German donor involved in the establishment of ATTS. These studies have not been published.

A noteworthy study within the same category was conducted by the Faculty of Social Sciences of the University of Botswana (1985). See section E below for further details.

The *third category* of tracer studies is that conducted by *scholars* - Kann (1981); Emanuelsson et al. (1988) and Setidisho and Sanyal (1988). Compared to other studies, these studies cover a much broader scope, and are more thorough in methodology and analysis. Kann, for example, looked at the employability of the 1976 form five leavers, two and a half years after graduation. She further assessed how the activities of the school leavers correlate with factors such as academic achievement in the Cambridge examination and the quality of the school as denoted by factors such as 'the headmaster's years of experience' and 'school equipment'.

The brigades was the focus of the study by Emanuelsson et al. (op. cit.). Trainees who had completed their training at four different brigades between 1984 and 1987 were traced in this study.

Setidisho and Sanyal (op. cit.) on the other hand looked at the cost-effectiveness of post-secondary training institutions, particularly the University, the employability of the graduates, their educational and occupational expectations, and the relationship between academic performance and job performance as perceived by the employers.

A *fourth category* of studies is categorised by its less comprehensive approach. It is a recent entry on the scene of tracer studies referred to as the *"quick and dirty"* approach by Kann (1989). It was used in a mini-tracer study of 1986 Junior Certificate leavers, and will be further explained below.

Most of the studies above are solely concerned with the employability of school leavers. Psacharoupolos & Hinchliffe (1983) argue that, in carrying out tracer studies, it is a waste of time to concentrate only on the external efficiency of the educational system, when it is possible in the same study also to collect other information, that would help to improve internal efficiency of the school and to assess the private rate of return to schooling.

Brief Summaries of Significant Tracer Studies

A. Primary School Leavers

Only one tracer study of primary school leavers has been undertaken (Central Statistics Office, 1981). Pupils leaving primary school at the end of 1979 were traced half a year later. The majority of the 1979 primary school leavers were in school in June 1980. 36% were in secondary school (70% in government schools and the remaining in private secondary schools). Another 36% were repeating Standard 7 and 1% was in vocational training, mainly in brigades. Only 2% were employed. Among those employed, there is no differentiation according to grade obtained in the Primary School Leaving Examination (PSLE). The remaining 25% were unemployed. Unfortunately, age of students was not a factor included in the study.

In summary, already in 1979 it was difficult for primary school leavers to get employment and most stayed in the educational system for at least another year after finishing primary school.

B. Brigade Leavers

Brigades were initially set up to provide vocational training for primary school leavers, who did not continue to secondary level education. The main objective was training for self-employment in rural areas. Three tracer studies of brigade leavers exist, i.e. from 1976, 1979 and 1988 (Kukler, 1976; CSO, 1981 and Emanuelsson et al., 1988).

The 1976 study attempted to cover all of the approximately 1 300 brigade leavers since the brigades started in 1965. About one third answered the questionnaire. Seven per cent of those who answered did not have a job. The majority (83%) had found work within three months of completing their training. Fifty per cent were working in rural areas, 38% in towns and 12% did not answer that question. Their employment rate was certainly much higher than that of primary school leavers, though the self-employment rate (3%) was rather low for an institution established for that very purpose. Also compared to secondary school leavers, the employment rate of brigade leavers was high in the 1970s.

The three tracer studies of brigade leavers do not have the same design and our comparison has to be interpreted with slight caution. Also, the answer rate varies substantially between the three studies. Although the majority of brigade leavers appeared to secure employment after training, even in 1988, there is a trend of increasing unemployment among brigade leavers according to Table 1. However, it is obvious that the data as presented is fairly crude and does not necessarily give an exact picture. For example, the waiting period before obtaining employment might have increased, therefore giving what appears to be a higher unemployment rate in 1988.

Table 1
Tracer Study of Brigade Leavers 1976, 1979 and 1988

Activity	1976 %	1979 %	1988 %
Further training	0	2	3
Employed	93	86	77
Unemployed (At home)	7	12	20
TOTAL	100	100	100

Source: Kukler, 1976; Central Statistics Office, 1981;
Emanuelsson et al., 1988.

C. Junior Certificate Leavers

Three tracer studies are available of Junior Certificate leavers. The first two studies are of 1978 (CSO, 1979b) and 1979 (CSO, 1981) JC leavers and the last is of 1986 JC leavers (Kann, 1989). The results from the first two are not very different from each other. A higher proportion of the 1979 than of the 1978 leavers had managed to obtain a place for further education. (Form 1 places increased faster than Standard 7 leavers that year.) However, those in employment dropped and those unemployed stayed almost the same as in 1978.

The 1986 study is not fully comparable with the two earlier studies, though the results have been put in the same table. This study was carried out in only four schools. All four were Community Junior Secondary schools. The methodology is elaborated upon further below. Suffice it here to say that the fact that *12% of the JC leavers had managed to get employment, the same proportion as in 1979* is quite unexpected.

The 1978 and 1979 studies covered both government schools and private schools. The two types of schools have traditionally produced very different JC results, with government schools being academically superior. The JC leavers in the four schools in the 1986 survey were part of the 1984 intake to junior secondary education. In 1984 joint intake to government and community junior secondary schools had not yet began, and thus our sample consisted mainly of those academically weaker students who had not managed to be admitted to government schools. This is reflected in their JC results and in their rate of progression to senior secondary level.

The overall proportion of JC leavers in 1986 continuing to Form 4 was 37% compared to the 13% in our small sample of community junior secondary schools. Probably the most important finding in this study was the high proportion of repeaters (14%) in a system that formally does not allow repeating.

Table 2
Tracer Studies of Junior Certificate Schoool Leavers

Activity	1978 %	1979 %	1986 %
Formal Education			
Form 4	41	47	13
Repeating	2	3	14
Total in School	43	50	27
Training	8	9	14
Employment	18	12	12
Not employed	31	29	47
TOTAL	100	100	100

Source: Central Statistics Office, 1979b and 1981.
Kann, 1989.

A tracer study of 1987 JC leavers has been prepared jointly by the Central Statistics Office and the University of Botswana (NIR), but the results are not yet available.

Four Case Studies - the "Quick and Dirty" Type

Tracer studies of a conventional type are time-consuming. In two recent research projects (Tshireletso & Kann, 1987 and Kann et al., 1988) information about the educational and job opportunities for Junior Certificate graduates was badly needed. Therefore, on-the-spot tracer studies of the 1986 J.C. leavers were made in four different communities.

The starting point was the list of the Junior Certificate Examination Results from 1986 published by the Ministry of Education. This list was presented to school administrators, teachers, some 1987 Form 3 students and some 1986 JC leavers, who were present in the four villages where the study took place. These people were asked to tell the researcher the whereabouts and activities of as many of the students on the list as possible, and the researcher noted the answer on the list according to different categories. The categories were developed during the first case-study and functioned well for the following studies.

Three basic categories were used i.e.

- Education/training
- Employed/working
- Unemployed

The education/training category was used if the student was in formal education, i.e. either in Form 4 (senior secondary school) or in some way repeating junior secondary school. The Botswana school system applies automatic promotion and, according to the regulations it is thus not possible to repeat Form 3. However, as the studies showed, there are obviously ways around the regulations.

In the employed/working category, place of work (town/village) and, if known, employer and kind of job were noted. It was easier to get information like "I know she is working in Maun" than the more specific information "She is working as a shop-assistant in X shop in Maun".

In the last category girls that were pregnant or had got a child and those who were helping parents at cattle-post or lands were included. It can be argued that taking care of one's own children or working in family agriculture should be placed in the category of employed/working. As we were to a great extent interested in formal employment we choose to categorise them as unemployed. However, in other contexts we would have categorised these people as employed or working. If there was information that a school leaver was 'idling', 'doing nothing', 'walking the streets' or 'looking for work' his or her physical whereabouts was also usually known. E.g. 'He is looking for work in Francistown' or 'She is idling in Seronga'.

Though the information was not collected directly from the individual, there was a built-in control system in that several people looked at the same list of names. It was rare that people disagreed, though at times there was an argument about who had the latest information.

A common problem in tracer studies is the low response rate. The approach used in this study turned out to be quite successful in that respect in that between 81% and 92% of the 1986 JC leavers in the four schools were traced.

The tracer studies were carried out at Tshegetsang Community Junior Secondary School in Molepolole, Ramotswa Community Junior Secondary School in Ramotswa, John Nswazwi Community Junior Secondary School in Marapong and Okavango Community Junior Secondary School in Gomare. The first two schools are located in fairly large villages close to Gaborone. Marapong is a small village some 70 km South-West of Francistown. Gomare is the most isolated of the four villages, situated in the North-Western part of the country in Ngamiland.

For the analysis of the findings, an understanding of the four communities is essential. However, we are here more interested in the methodology as such, and have therefore not included village descriptions. The results of the four tracer studies are shown in Table 3.

Between 5% and 21% of the Junior Certificate leavers in the four schools have managed to secure a place in a senior secondary school. The overall level of Junior Certificate results of a school is an important determinant of further education of its graduants.

A high rate of repetition in all four schools was a surprising finding, considering the secondary school regulations do not really allow repetition. The inventiveness of parents and students in finding ways to repeat, and thus to get a second chance, is impressive, and indicates the high social demand for education. It also indicates a labour market situation that increasingly requires paper qualifications even for unskilled work.

Between 11% and 14% of the Junior Certificate leavers have managed to secure some kind of training position. As could be expected, somebody with a 3rd class pass stands a better chance of securing a training position, than somebody who failed, an indication of the increasing formal qualification escalation (diploma disease) entering training institutions.

Overall we find that no student in the four case study schools obtained a 1st class pass. All those who obtained a second class pass got a place in senior secondary school. Of those who obtained a third class pass 26% are in formal schooling (Form 4 or repeating) 19% are in training, 11% are employed and 45% are unemployed.

Table 3
Proportion of 1986 Junior Certificate graduates from four selected schools by activity in August-September, 1987

	Schools			
	Ramotswa (N=130)	Tshegetsang (N=129)	John Nswazwi (N=106)	Okavango (N=114)
Response rate	88%	88%	81%	92%
	%	%	%	%
EDUCATION				
Form 4	5.2	13.1	20.9	17.1
Repeating	23.5	7.9	17.4	6.7
Sub-total	28.7	21.0	38.3	23.8
TRAINING				
Typing	7.0	1.8	2.3	2.9
BDF	2.6	2.6	7.0	4.8
Police	1.7	3.5	4.7	6.7
Prisons	0.0	0.9	1.2	0.0
Brigades	0.9	1.8	0.0	0.0
Other	0.9	0.9	0.0	0.0
Sub-total	13.0	11.4	14.0	14.3
Total education/ training	41.7	32.4	53.5	38.1
EMPLOYED	8.7	9.6	10.5	19.0
Sub-total	8.7	9.6	10.5	19.0
NOT EMPLOYED				
Pregnant/baby	4.3	9.6	8.1	10.5
Jobseeking/idle*	43.5	43.8	29.1	31.4
Lands/cattlepost	1.7	4.4	0.0	0.9
Sub-total	49.6	57.8	37.2	42.9
Not traced	11.5	11.6	18.7	7.9

Source: Kann, 1989.

It is somewhat difficult to explain the differences between the schools regarding success in getting employment. For example, 19% of students from Okavango CJSS have managed to secure some kind of employment as against 10.5% of the students from John Nswazwi, and only 8.7% and 9.6%, respectively, of the students at Ramotswa and Tshegetsang. One would have assumed that the easy access to Gaborone for students from Ramotswa and Tshegetsang and to Francistown for students from John Nswazwi would have facilitated them obtaining employment in these urban areas. Instead it is the students from Gomare, and from even further north in the Okavango Delta who have managed to secure jobs, mainly in Maun, which is 270 kilometers from Gomare on a very rough road with little regular transport. However, some possible explanations come to mind.

Competition for jobs in Gaborone and Francistown might be more fierce, than for jobs in Maun. Overall unemployment, especially among young people, is higher in urban areas than in rural ares. It is not only Junior Certificate leavers from Marapong that go to Francistown to look for work, but students from the three secondary schools in Francistown itself and students from a number of other secondary schools in the northern part of the country also go there. Gaborone most likely is receiving jobseekers from all over the country. The J.C. job-seekers in Maun come mainly from the two secondary schools in Maun and from Okavango CJSS.

Tracer studies in other countries have shown that in general it pays off for the school-leaver not to take the first available job, but to "wait and see". A combination of higher expectation and a more sophisticated job-seeking attitude among John Nswazwi students, might mean that they are still in a period of "wait and see". This interpretation is supported by the fact that we found a higher proportion of known actively job-seeking J.C. leavers from John Nswazwi CJSS (18%) than from Okavango CJSS (13%).

Age is an important factor in obtaining employment. Unfortunately, we do not have information about age of students in our case study schools. However, some knowledge about historical development of education in Ngamiland, where children traditionally have been older upon entering school than in the rest of the country, makes us believe that those Okavango school leavers who have been successful in obtaining employment, might be older than their unfortunate peers from other areas who have remained unemployed.

The kind of tracer study described here has been referred to as "the quick and dirty" kind (Kann, 1989). This approach proved to be feasible eight to nine months after the students left school. It is doubtful if it will be as successful if applied to a time-span of more than a year after students have left school.

Maybe the most positive aspect of this approach is that it lends itself nicely as project work in career guidance for school leavers. School leavers all over the world, but especially in developing countries, have very high expectations regarding possibilities for future study and work (Kann, 1977; Little, 1978; and Kann et al., 1988). We believe that, if Junior Certificate leavers were made to carry out a tracer study of previous year's school leavers, and actually make the analysis themselves, e.g. calculating the proportion continuing for further education, etc., this could have a sobering effect on their expectations. It would also facilitate discussions in class on various opportunities for study and work after junior secondary education.

D. Cambridge Leavers

We have seen above that it is no longer easy for Junior Certificate holders to obtain a job in the formal sector. If Cambridge leavers (Form V) are starting to experience problems in getting employment or training opportunities, they will start competing for the same jobs and training opportunities that the junior secondary leavers are opting for.

Tracer studies are available of the 1976, 1977, 1979 and 1985 Cambridge leavers (Central Statistics Office, 1979a and 1981; Kann, 1981; Central Statistics Office, Preliminary data regarding 1985 study). The 1977, 1978 and 1985 studies were follow-up tracers, whereas the 1976 study was of a retrospective type, tracing the 1976 leavers two-and-a-half years after they left school. Though not ideal for comparison, the four studies have been included together in Table 4. By 1985 the Tirelo Setshaba Scheme for Form 5 leavers had been introduced and thus a high proportion of the students were still in the scheme when the tracer study was carried out. For comparison, they have been treated as if in school/training.

Some of the variations in results between the different studies can undoubtedly be explained by differences in methodology and timing. However, the 1977, 1979 and 1985 studies are fairly comparable. The increasing unemployment among Form V leavers is of concern. The National Manpower Development Planning 1985 document (Employment Policy Unit, 1985) projected a situation, where there would be a surplus of Form 5 leavers without further training already in the mid-1980s, whereas there would still be a shortage of such people with additional training. If such further training possibilities are not available, Form 5 leavers are likely to start competing with JC leavers for jobs, which will aggravate the situation for job-seeking JC leavers.

Table 4.
Tracer Studies of Form 5 Leavers

Activity	Year of Leaving School							
	1976		1977		1978		1985	
	N	%	N	%	N	%	N	%
School	77	27	263	33	271	29	33	4
Tirelo Setshaba	-	-	-	-	-	-	404	44
Repeating	-	-	9	1	2	0	3	0
Training	56	20	132	17	140	15	37	4
Sub-total	133	47	404	51	413	44	477	52
Employed	138	49	352	44	370	40	196	21
Unemployed	10	4	36	5	142	15	245	27
TOTAL	281	100	792	100	925	100	918	100
Percentage traced	91% of sample		89% of total		77% of total		45% of total	

E. University Graduates

In Botswana, unemployed university graduates are virtually unheard of. In fact, the scarcity of local professional personnel forces government and private sector alike to rely heavily on expatriate staff. In such a situation and with the additional factor of Botswana's comparatively small economy, it becomes important to have access to the correct mix of trained and professional people. Government, which funds most post-secondary education, cannot afford to train a surplus of lawyers, while it still has a shortage of other categories of professionals. As already indicated manpower planning and educational planning, especially at university level, go hand in hand in Botswana.

However, the university is primarily an academic training institution, even though its courses assumingly are preparing students for professional jobs. This contradiction led to the tracer study of graduates from the Faculty of Social Sciences carried out in 1985 (Mhozya, 1985).

Its purpose was to ascertain "the adequacy, effectiveness and appropriateness" of the programmes offered by the Faculty of Social Sciences (FSS). It was sparked off by manpower planners in Government accusing the University and especially FSS, of producing unemployable graduates. For example, students graduated in Sociology or Political Science, though there were no posts in Government (or elsewhere in the country) for 'sociologists' or 'political scientists'. A very narrow manpower planning approach indeed, but still powerful in relation to the development of the local university.

III. Conclusions

The many tracer studies carried out in Botswana have exposed crucial factors concerning methodology in conducting tracer studies. The time factor is probably the most important of these factors. Thus tracer studies have to be repeated on the same cohort in order to get a longitudinal perspective. The same group of school leavers should be traced several times after leaving school, e.g. after 6 months, after one year and after two years and, we would say that they have to be traced over an even longer time period if we really want to understand the relationship between education and employment. In addition, several cohorts of school leavers have to be followed. For example, among the many tracer studies identified in Botswana only one has been made of primary school leavers (1979). Using existing tracer studies it is thus not possible to conclude anything about the changing situation for primary school leavers. There is a lot in favour of making the studies more comprehensive. On the other hand "the quick and dirty approach" advocated above also has some substantial advantages.

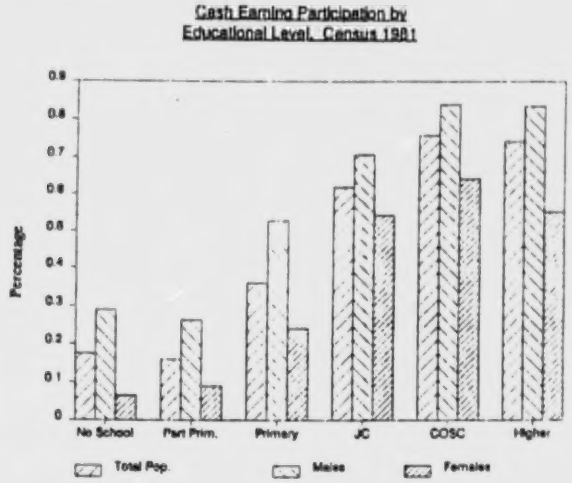
The statistical treatment of students that are not traced through the study is also important. In the studies detailed above, those *not* traced have been excluded from the calculations assuming that those not traced are divided over the different categories in the same way as those that were traced. However, it is quite possible that those not traced are unemployed to a greater extent than those who are traced. Thus a certain caution has to be exercised in interpreting the results, when comparing different studies.

The use of the tracer study as an evaluation tool in training institutions is gaining momentum in the country (Chilisa, 1987). In a workshop on Programme Evaluation Methods and Application for Training Institutes held in mid-1987 a number of participants from various training institutions were introduced to the use of the Tracer Study for evaluation purposes. The objective was to improve courses and programmes. The improvement, it was suggested, could range from assessing the cost-effectiveness of the programmes, the relevance of the programme to the job market, and the employability of school leavers, up to the aspirations and expectations of the leavers.

IV. Tasks for group discussion

(i) From the knowledge you now have of education, manpower and employment in Botswana what kind of tracer study programme would you recommend to be undertaken were you an educational planner in the country? Discuss priorities regarding level of education, extensive versus 'quick and dirty' studies, etc. You should be able to argue your case with the Ministry of Finance and Development Planning, e.g. for funding and staff for the study.

(ii) The graph below attracted the attention of a high level government official. She indicated that maybe it contained a clue regarding how to ease the shortage of professional/skilled manpower without recruiting as many expatriates as is the case at the moment. What did she see in the graph? What would you suggest should be done to find out more substantial information?



EMPLOYMENT, UNDEREMPLOYMENT AND UNEMPLOYMENT BY HIGHEST ACADEMIC QUALIFICATION

	None	Lower Primary	Upper Primary	Lower Secondary	Upper Secondary	Tertiary	Not Stated	Total
Employed	121333	35097	83925	23063	7460	3841	135	274853
	72%	70%	65%	69%	88%	96%	94%	70%
Underempl.	12654	3987	7002	739	118	32	0	24532
	8%	8%	5%	2%	1%	1%	0%	5%
Unemployed	34034	10823	37532	9698	865	136	8	93096
	20%	22%	29%	29%	10%	3%	6%	24%
TOTAL	168021	49907	128459	33500	8443	4009	143	392481

Source: Labour Force Survey 1984-85. Central Statistics Office 1985.

(iii) Unemployment as a concept is a fairly novel issue in Botswana, and youth unemployment has entered the field of discussion even later. One argument which is gaining increasing support, is that the number of places in senior secondary schools should be increased. Using information from the various tracer studies above and from the Table below discuss whether the proposal is wise. List what additional information you need in order to advise your permanent secretary.

(iv) A journalist has got hold of your report regarding brigade leavers and writes an article headed "Brigade leavers unemployed". Your ministry is about to present a request for more funds to brigade training. The article causes a lot of debate. You have to write a special briefing note to the minister. What would you write based on the information from the tracer studies provided in this paper. List your main points.

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Chapter 11

Practical exercises on tracer studies

by B.C. Sanyal and Ulla Kann

A. Table 1 gives the reasons for pursuing higher education by male and female students in Zambia.

(i) Identify the major reason(s) for pursuing higher education by these two groups.
(ii) How do the reasons for pursuing higher education vary among these groups?
(iii) What types of policy implications can be derived from these results?

B. Table 2 gives the scores of different factors which assist in obtaining jobs by method of recruitment in Tanzania.

- Identify the relative significance of the different factors in obtaining jobs for each of the methods and coment on the results.

C. Table 3 provides information on earnings of graduates by level and type of education in Tanzania.

- Comment on the earnings pattern

(a) by age group
(b) by sex
(c) by level of education
(d) by faculty of education
(e) by specialization

Table 1. Reasons for pursuing higher education by male and female students in Zambia

Why undertook post-secondary training		Unknown	Sex		Total
			Male	Female	
Unknown	Number	3	112	54	169
	% Total	0.09	3.30	1.59	4.97
	% Row	1.78	66.27	31.95	100.0
	% Column	7.32	4.57	5.95	4.97
Professional qualification	Number	27	1 762	662	2 451
	% Total	0.79	51.84	19.48	72.11
	% Row	1.10	71.89	27.01	100.0
	% Column	65.85	71.92	72.91	72.11
Bursary incentive	Number	0	38	5	43
	% Total	0.00	1.12	0.15	1.27
	% Row	0.00	88.37	11.63	100.0
	% Column	0.00	1.55	0.55	1.27
Study for its own sake	Number	6	215	71	292
	% Total	0.18	6.33	2.09	8.59
	% Row	2.05	73.63	24.32	100.0
	% Column	14.63	8.78	7.82	8.59
Better employment opportunities	Number	5	323	116	444
	% Total	0.15	9.50	3.41	13.06
	% Row	1.13	72.75	26.13	100.0
	% Column	12.20	13.18	12.78	13.06
Total	Number	41	2 450	908	3 399
	% Total	1.21	72.08	26.71	100.0
	% Row	1.21	72.08	26.71	100.0
	% Column	100.0	100.0	100.0	

Table 2. Scores of different factors which assist in obtaining jobs by method of recruitment in Tanzania

Methods of getting jobs	Academic record	Aptitude tests	Interviews	Past experience	Letters of recommendations	Physical appearance	Marital status
Institution attended	126	44	23	19	36	25	6
NHLMAC*	249	57	43	29	51	20	4
Appointments bureau	20	8	3	2	7	1	1
Newspaper advertisements	9	5	5	6	5	4	2
Personal contacts	47	15	30	18	17	14	3
Employment bonding	218	45	40	43	43	21	4
Others	4	3	4	2	2	1	0

* National High Level Manpower Allocation Committee

Table 3. Average gross monthly salary at beginning of career and at time of survey with standard deviations by different characteristics

Characteristics	Gross monthly starting salary (in Shs.) average	Gross monthly salary at time of survey (in Shs.) average
Age-group		
20-25 years	1 003.397	1 143.000
25-30 years	1 150.364	1 579.137
more than 30 years	1 124.680	2 177.131
Sex		
Male	1 133.789	1 640.932
Female	1 087.905	1 459.955
Actual specialization		
Natural scientist	1 067.231	1 450.583
Engineer	1 371.895	1 941.905
Social scientist	1 113.803	1 653.627
Humanistic professional	942.438	1 407.848
Health professional	1 623.286	2 119.000
Business and managerial	1 103.964	1 702.889
Agriculturist	1 245.600	1 709.000
Lawyer	1 227.857	1 813.714
Others	1 179.600	1 662.727
Sector working		
Government	1 121.440	1 567.173
Parastatal	1 148.015	1 816.536
Private	912.500	1 165.917
Highest qualification		
Diploma : 1 year	735.044	1 028.080
Diploma : 2 years	869.023	1 099.617
Diploma : 3 years	1 047.222	1 537.115
First degree	1 260.948	1 785.634
P.G. diploma	1 005.428	1 700.714
Second degree	1 417.000	2 502.500
Third degree	1 350.000	2 814.500
University faculty		
Arts	1 187.557	1 768.152
Science	1 307.477	1 850.723
Agriculture	1 379.273	1 926.818
Engineering	1 580.071	2 150.875
Medicine	1 852.600	2 393.000
Law	1 235.000	1 853.615

Chapter 12

The Informal and micro-enterprise economy in Africa: new challenges for planners

by Kenneth King

Introduction

The informal sector and the micro-enterprise economy have dramatically raised their visibility on the agendas of governments, aid agencies, and non-governmental organisations (NGOs) in the last several years. We shall suggest that this recent development is inseparable from the thinking about the larger crisis in Africa. It is also closely connected with the dramatic expansion of schooling at the secondary level, and with concerns about the functioning of the training systems in Africa. Beyond these factors, there is some evidence of the need to think much more comprehensively about policies for small scale enterprises. This last development is beginning to raise questions about the role of a national policy for the informal sector, if the various initiatives in education, training, and other sectors are really going to be grounded in a supportive environment.

1. Structural issues relating to the informal sector

The following items are not common to all states in the SADCC region, but they are perhaps shared by the majority of sub-Saharan African economies. First, the crisis in the state itself has had obvious implications for thinking about the informal sector. Many states have experienced processes of structural adjustment which have had the effect of reducing the role of the state, especially in the sphere of employment and in the provision of the social services. This has resulted in layoffs from the civil service and from the parastatals, and in the beginnings of a realisation that the state cannot itself continue to be the employer of last resort. Indeed, for some countries there is a strong sense that the state has been over-extended, and over-manned, even though the formal sector of employment is still very small. Often the state dominates the formal employment sector, contributing sometimes as much as 75% of the total number formally employed. The hard fact is, however, that this formal sector of the economy is itself still a very small proportion of the total of the economically active population. It may be as low as 5%; it is frequently around 10 to 15%, and then in one or two favoured countries, such as Botswana, it rises to around 40%.

There is a problem also with what used to be thought of as the sector of good, secure jobs. Viewers of Ronald Dore's *Diploma Disease* will recall his characterisation of these small numbers of good real jobs, and the safety and the security they offered. But this characterisation dated back to the mid 1970s, long before the massive erosion of the value of public sector salaries began. It is unfortunately now no longer the case that a government job offers financial security. In some cases, the salaries of such groups as primary school teachers no longer constitute a living wage, but may only allow a family to get through a third or a half of the month. Thus the wage earners have to seek a second job, or a second or third source of income. And in many cases these additional sources of income are to be found in the informal sector.

It is not therefore the case that the informal sector is to be thought of as something separate from the formal sector of employment. Many formal sector workers "straddle" the two sectors, with one foot in a government or private sector job, and the other in some enterprise of their own making. In the example of teachers, this second job may be private tuition; in the instance of car mechanics and carpenters, it may be that a second job grows up round their home or compound during the evenings or at the weekend, as they take orders to mend cars or make furniture on their own account.

Other aspects of structural adjustment have also had some impact on the informal sector: the liberalisation of imports has encouraged the arrival of large amounts of second hand (or new) clothes. This in turn has produced redundancies in the local textile sectors of African economies, and has also affected the work of large numbers of tailors who previously had been making whole suits and dresses, but who now found themselves mending and merely altering the imported items. In West Africa this new regime is colourfully referred to as "dead white man's clothes", but it is a phrase that captures the dilemma of liberalisation very neatly.

Apart from the way that the economic crisis has intervened and altered the lives of many of those working in the formal sector of the economy, it must not be forgotten that for the bulk of the population there may be no question of searching for an additional source of income in the informal sector; they are already in the informal economy. We have mentioned that some of them - tailors - may well have been affected by the liberalisation of trade in cheap clothes. But for many of those working in the informal economy, we know very little about the impact of the crisis. Certainly, it seems likely that many households will have been obliged to take on an extra informal job, possibly by the wife growing and selling vegetables, or making and selling clothes. These multiple jobs **within** the informal sector are probably one response to the wider economic crisis.

We must also recognise that within the SADCC region, and more widely within the Eastern African and Western African region, there are already many different traditions of the informal economy emerging. It is probably nowhere similar. Thus in Kenya, the *jua kali* (or hot sun) workers of the informal sector may illustrate a particular tradition of working outside in the open. In Zimbabwe, the term *Siaso* (let them be) perhaps points to a tendency in that country to take rather a hands-off approach to the emergence of the informal economy. There are much older traditions of informal economy in parts of West Africa, and there the culture of trading is often so widespread that it seems inappropriate to term it the "informal" economy; it seems much more like the "ordinary" economy.

2. Democratisation of education and its impact on the informal sector

One very powerful factor in drawing attention to the informal economy has been the economic crisis affecting the state and underlining its incapacity to produce the jobs needed for its burgeoning population. Another very important influence in the recent thinking about the informal sector has been the success of educational expansion. The success however contains within itself elements of tragedy. The more successful a national education system is in expanding and extending school provision, the more clear does it become that the new generations of school goers cannot expect to inherit the kinds of advantages that were associated with western schooling when it was in short supply. The days are not long past when seven or nine years of education guaranteed a young person the choice of a wide range of enviable jobs. Now the notion that seven years of education can guarantee access to a good job is faintly ridiculous. Even 12 years of schooling cannot deliver a secure job, unless there are very good grades.

The situation has changed so dramatically for the simple reason that the number of jobs in the formal sector has nowhere been able to keep pace with the speed of educational expansion. Even in the countries that sought, like Tanzania or Malawi, to throttle back secondary school expansion, it was found that just a few secondary school leavers was too many for the available jobs. By contrast in countries such as Kenya, Nigeria or Zimbabwe that encouraged very broadbased entry to secondary schools, it became plain that even a single cohort of secondary school leavers was larger than the entire workforce engaged in manufacturing. Apparently, in some of the francophone countries with very small industrial economies the output from schools each year is three times larger than the formal industrial jobs.

The political reaction to the dilemma of popularising education has been remarkably similar across the countries in the region. It has produced a very strong new interest in the vocationalisation of the basic cycle of education - meaning the introduction of some skills component. It has also resulted in some countries in the development of courses and units concerned with the orientation to business and enterprise. The aim of such courses is not, naturally, to prepare young people for the formal sector of the economy, but rather to alert them to possibilities in self-employment. Even in the case of Botswana, whose formal sector is rather large, there has been an explicit support for the notion of "self-employment preparation units" in the basic school system.

These interests have, we have said, produced new orientations in the syllabuses of many SADCC countries, but much of this is so recent that little can yet be known about the effect of these in-school interventions. But the whole process of seeking to determine the effect after school of such initiatives is immensely complicated. The political position is relatively simple: that education, plus a little skill, plus a little business orientation will somehow lead to informal self-employment. For the researcher or planner it is rather less simple to evaluate the impact of such innovations. For one thing, those who left primary school or junior secondary school were already going into self-employment, without any orientation course in the schools. What additional advantage can be expected if the schools seek quite explicitly to orient their pupils in this way? Can it really be expected that the currently very high aspirations of young people to continue their education to the highest level possible will be significantly diverted by some injection of enterprise education, or some practical subjects? Will pupils really begin to pay attention to the potential of enterprise education until they have experienced at first hand the hard facts about the absence of formal sector jobs? Currently we have no answers to these questions, but what is beginning to become plain is that parents, pupils and teachers (as well as politicians) are re-examining subjects like vocational skills and business skills since these may operate as some sort of fall-back or insurance against failure to proceed with further education.

Many states are at the moment involved in what may seem like a contradiction in their political discourse about education. On the one hand, the encouragement to democratise further the opportunity for secondary and further education remains very strong. Communities continue to be exhorted by politicians to assist the state with widening the provision of schooling. Simultaneously, the Ministry of Education (and often the president or prime minister) is urging the re-orientation of schools towards self-employment. This dual expectation of schools -- that they should prepare for further education as well as for self-employment -- is a heavy responsibility, and if it is to be effective it will imply a new kind of teaching, with much more effective guidance and counselling than are currently commonplace in African school systems. But it must be admitted that there is something paradoxical about continuing to build secondary schools towards universal provision and to be warning at the same time that there will be virtually no leavers from junior secondary education who can expect to get formal sector jobs.

3. The interest in democratising the training systems of Africa

Parallel with the changes in the education system which are having the effect of rethinking the purpose of basic education, there are strong indications of new initiatives in the training systems of Africa. For many countries during the first two or three decades of independence, these systems were very small if not tiny. They sometimes were labelled "the National Vocational and Industrial Training Centre" or "the National Youth Service", but in most cases these very large names concealed the fact that there were only a few hundred trainees altogether in these systems. In addition, these small cohorts of students predominantly were drawn from the larger firms in the modern sector of the economy and from the sectoral ministries, such as Works, Transport, and Housing. The training institutions had few linkages with the informal and micro-enterprise economy. There are now, however, several changes afoot.

First, there is quite a widespread recognition that the balance between providing education and training has not been appropriate. In the words of the Minister of Education of Botswana: "Too much education and too little training" (1989). This perception has begun to translate itself into schemes that seek to offer something approaching a national provision. There is no longer talk nowadays of pilot schemes, or of experimental projects. The discussion is rather about arranging for there to be one vocational training centre for every region, or one youth training centre for every town. This is recognition that the old scheme of things, in which most of the places in the VTCs or the National Polytechnics were taken by *inservice* trainees is changing rapidly and being replaced by much larger numbers of *preservice* trainees, not sponsored by industry, but taking training courses as a way of preparing themselves for work or employment. The switch from inservice to preservice trainees underlines the move from a form of manpower planning based on the needs of the most "progressive" employers to a system that is based much more on social demand. This is already obvious in some of the courses offered in VTCs and polytechnics, for example business and commerce, but pressure is now being felt also on the high prestige engineering and mechanics courses in such institutions.

Again, there are of course anomalies in such developments. As governments get more stretched for resources, and as it becomes more clear how few formal sector jobs there are, the politicians are increasingly serious about providing national systems for vocational training. But they are no longer concerned merely with extending provision. In parallel with moves we have noted in the school system, the vocational training institutions are now routinely being requested to add to their courses a serious concern with enterprise training, or with preparation for self-employment. Illustrative of this tendency is the request from a recent White Paper in Kenya that "Formal training programmes be oriented to take into account the special training needs of the informal sector with particular emphasis on providing entrepreneurship skills" (Kenya 1988). This is by no means an isolated instance, but it could be multiplied easily in other countries of the SADCC region, as well as West Africa.

As with the schools, so with vocational training institutions, it will not be straightforward to encourage them to enter the world of preparation for self-employment. It will mean a good deal of rethinking about the courses, the times when these are offered, and some new awareness of the needs of the clientele in the informal economy. As vocational training systems start to rethink their objectives, and begin to recognise their obligations towards many new and unconventional trainees, it will probably be necessary to develop new models of vocational training, at lower cost and greater flexibility.

4. Recognising the existing induction systems in the informal sector

While ministries of education and of labour are increasingly considering innovations such as those we have been reviewing, it is important to note that the informal sector has not been waiting for these new initiatives to be put into place. We have already said that large numbers of young people were entering the informal sector long before there was talk of re-orienting schools and training systems to self-employment. And in many cases these particular young people were the very ones who were the failures or drop outs from the formal education and training systems. Their inability to proceed with education (for lack of fees, ability or sufficient places) was a very powerful lever towards self-employment. So it is somewhat paradoxical that the institutions which played this selection role are now being charged with the preparing of young people for self-employment.

However, as governments become serious about self-employment, it is obviously important for them to know a great deal more about the *existing* systems of induction into skills in the informal economy. The changes being contemplated for education and training institutions must take account of the strengths and weaknesses of the training within micro-enterprises. Already we know enough to say that there are wide differences in the induction systems of East and West Africa, and differences again in the much more recent informal economies of Southern Africa. It might be generalised that the informal apprenticeship systems of West and North Africa are the oldest and most institutionalised; next come those of Eastern Africa, and then much more recent are the developing systems of Central and South Africa. A whole series of formalities surrounds apprenticeship in a country like Nigeria; whereas in Central and Southern Africa entry to the informal economy is a relatively new experience, and the terms and arrangements are nowhere of long standing.

But for those planning some support to education or training for self-employment through schools or training agencies, it will clearly be important to know what is the content of the induction in particular trades, how long does the informal apprenticeship last, what expectation is there that trade tests or other national certification should be acquired, what is the importance attached to formal schooling? As the level of education amongst young people rises anyway, this may have an impact on the informal sector quite distinct from any specialised courses. From the current World Bank/ILO studies on the informal sector and on apprenticeship in six different African countries, much will surely be learned that will assist planners and curriculum developers in the formal sector to design courses that will take account of what is already in place in the informal economy.

Lest the notion of the formal sector studying the informal sector appear bizarre, it should be noted that Nigeria, through its National Open Apprenticeship System, is seeking to attach tens of thousands of school leavers to masters who are established in the informal economy. The latter will be used as a resource for training school leavers, and for exposing them to the culture of self-employment. We may expect therefore a good deal more liaison between schools and enterprises over the next short while.

5. The emergence of comprehensive national approaches to small scale enterprise support

We started this brief account of the way the informal sector has come back on to centre stage with a discussion of some of the wider structural factors affecting salaries and living standards in many African countries. It is appropriate now, in concluding these comments, to look outside the realm of education and training, and to consider what may need to alter in the formal economy itself if there is really to be a shift towards micro-enterprise. There is no doubt that schools are very influential institutions, but it is unlikely that new messages about enterprise and self-employment will make much headway unless there are parallel changes in the environment outside schools - in the infrastructure for small scale enterprise and in the supportive policies of the banking system. For education planners to put a great deal of effort into new curricula, new guidance mechanisms to highlight the enterprise economy without there being some complementary set of initiatives in the wider society might well be counter-productive.

Before looking at what these might consist of, we should note that most African countries already have in their possession some arrangements for offering support to small scale enterprise. Such institutions are often termed SIDOs -- Small Industry Development Organisations -- but they have seldom been concerned with the really small scale. They have dealt with larger clients, with relatively major loans and grants, and the overall numbers have not been significant. Nor have the results been very impressive. The fortunate few recipients have often remained in the security of purpose built industrial estates, with a good deal of technical assistance, and also a degree of protection for their products. By contrast what some countries are addressing now are policies that will have impact on much larger numbers of people, much lower down the scale.

The question of targeting is crucial. When the informal economy includes so many different kinds of enterprise -- from the petty traders on the roadside, to the cobbler under the tree, to carpenters making furniture of rather good quality -- planners need to consider who are their priority clients. Are they the group who are barely surviving, and who may be thought of as the subsistence self-employed? In some countries, there would appear to be large numbers of these, engaged in activities that scarcely allow them to make a living. Or is it the group that have begun to establish themselves, already have defined their product lines, and look poised to develop further? In a situation where not everyone can be thought of as a potential recipient, should the emphasis be on the more dynamic side of the informal economy? These policy issues do need to be tackled by the different bodies considering support to the informal sector. It may well be that some of the NGOs will concern themselves with the subsistence self-employed, and perhaps particularly with efforts to increase women's incomes in the informal sector. While other external agencies, and particularly the Banks may look to those elements in the informal sector who are already demonstrating a degree of dynamism, and who may be helped to become much more productive.

Whatever the clientele selected, a great deal will depend on the larger socio-economic environment in which all such enterprises will find themselves. Countries which have been exploring national action programmes for the small scale sector are paying a great deal of attention to this environment. In analysing what are the characteristics of a supportive environment, they have been identifying some of the following factors:

First, there needs to be some kind of *national policy* that can act as a foundation for a great deal of the more detailed mechanisms for support. Such a policy needs then to have instruments for its implementation, through particular programmes, in particular ministries, banks, and other institutions. But at the same time, the environment for micro-enterprise needs also to encompass policies relating to very specific matters, such as the provision of micro-industrial estates, the question of security of tenure, the issues of tax and licensing, and of access to electricity and other services. This is not to argue for some featherbedding for the informal sector, of the sort that we have implied has sometimes operated for the SIDO clients. Rather the state should seek so to intervene in the informal economy that it does not itself have to be responsible for all the day to day questions of who should be supported, with how much money, and under what conditions. Such matters should be decided by the regular financial institutions, and the state's role more properly should be with setting out and monitoring some of the terms on which the banks get involved with the informal sector.

Ideally the state's direct involvement should be very light. But it will need to set out the ground rules for the banks and other bodies.

Second, if there is to be some serious recognition of the role of the informal and micro-enterprise economy, there will need to be some major re-orientation and inservice training of government personnel in many of the ministries which deal with the economy and which have some direct contact with people in rural and urban areas. It is not just the Ministries of Education and of Labour who have to adjust curricula for the pupils; they have to adjust the thinking *of those doing the educational and vocational planning*. This means, for instance, that ministries who concern themselves with manpower planning will need to pay some attention to the implications of the informal sector for traditional manpower planning approaches. For too long manpower planning was only concerned with the very narrow band of jobs in the formal sector which were thought to need secondary or further education. But now that so many people have secondary education, it no longer makes sense to think of secondary school graduates as manpower categories. A new politics of manpower planning needs to take account of the ways in which the bulk of the nation's manpower acquires its skills and uses them. This reconceptualisation of manpower planning is only one example out of many that could be illustrated in different ministries. Others would include the need to develop new thinking about taxation, licensing, loans, industrial policy, and many more.

All of these are important, but probably none more so than getting the banking system oriented to micro-enterprise. Like so many other parts of the formal sector, it has not until recently conceived of its task in terms of relating to micro-enterprise. But if there is to be a breakthrough in releasing the energies of the informal economy, it is in the banking world that the greatest changes will need to be implemented. Governments will need to legislate for much larger proportions of banking business addressing the small scale sector. And in this matter, external agencies may be valuable catalysts in lending money to national banks, earmarked for onward lending to the informal sector.

The details of all these kinds of initiatives will alter from country, but their tendency will be similar. They will tend to cut across ministries, to be intersectoral, and to involve the main lending institutions in the various countries.

Conclusion

We started out by suggesting a variety of reasons why the informal sector was back on the agenda. As far as Botswana itself is concerned, it is now 15 years since the first informal sector survey of 1974. That early survey was carried out shortly after the term informal sector had become salient internationally through the employment missions of the ILO. But it is doubtful if the ILO's work at that time or the results of the informal sector survey carried much political weight in Botswana. Even now the dimensions of the imbalance between school expansion and the formal labour market are just beginning to be apprehended with real seriousness. Only a few of the elements described in the previous pages are getting a place on Botswana's political agenda, and there may not be for some time a concern with the development of a national policy. But this is nevertheless a good point at which Botswana can review the experience of other countries who have already moved quite far down the road of education and training for self-employment.

Botswana is in a particularly good position also to be cautious about any strategy that sought to suggest that education and training for the informal economy should somehow take precedence over the needs of the formal economy. The formal sector has been much too crucial to Botswana's development for there to be any question of giving priority to the micro-enterprise sector. Indeed, there ought to be no doubt about a trade-off between small scale, informal and medium and large scale. It should be quite clear that the recent importance being attached to the informal economy is not part of an attempt to get Africa to turn its back on progress, or on seeking to narrow the technological gap between the western industrialised countries and itself. If the enthusiasm for the informal sector is perceived in terms of a different future for Africa from the rest of the world, it will not last long.

Rather the new interest in the informal economy may be perceived in terms of equity and access. The energy and vitality of so much that is carried on in the informal economies of several countries is making a major contribution to productivity and employment. And states are exploring ways of tapping that potential that don't involve welfare approaches, but rather seek to apply to the informal economy some of the same advantages that have for long been available to larger firms.

In examining the implications for educational and manpower planning of the existence of the informal sector, Botswana and the other SADCC countries are making a timely contribution to policy formation. The deliberations of this workshop on Education, Employment and Work may well mark an important point on the road towards a more integrated approach to the formal and informal economies, and to the place of education and training systems in relation to both.

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Chapter 13

Botswana's informal sector: A State-of-Knowledge Review 1989 (Including practical exercise)

by Ulla Kann

I. Introduction

Less than half of the new entrants into Botswana's labour force between 1986 and 1996 can expect to find employment in the formal sector. No new jobs are expected to be created within traditional agriculture. So what remains for the rest?

> "... an employment creation strategy must not only seek to maximize the generation of formal sector employment, it must also be concerned with economic opportunities in the broadest sense" (Republic of Botswana, 1985, p.63).

Botswana's booming economy has supplied an impressive number of formal sector jobs during the last 10 -15 years. In 1976 formal sector employment stood at 60 000. Ten years later it had more than doubled and had reached 130 000 in 1986. However, it is not only the economy that is growing fast. Botswana also has one of Africa's fastest growing populations. Thus, in spite of its prospering economy Botswana sees its numbers and proportion of unemployed people increasing.

II. Unemployment

No regular monitoring of unemployment has been carried out in the country. The first comprehensive attempt to estimate the size of the unemployment problem was the Labour Force Survey in 1984/85 (Central Statistics Office, 1986a). However, Census figures from 1981 also give some indications of the size of the problem.

Thus while in 1981 the number of unemployed were estimated at 32 000 (10.2%), this figure had risen to 67 600 (17.9%) in 1986 and is projected to reach 130 600 (24%) in 1996 (Employment Policy Unit, 1988).

III. Definition of informal sector

The "informality" of the informal sector reveals itself in that there is little information available regarding this sector of the economy. People in this sector are not 'counted'. Thus we do not know exactly how many people find their income in this sector, nor do we know how much they earn or what they are doing.

The informal sector is often defined in terms of what is not the formal sector. For example, employment surveys of the formal sector cover central and local government, and private and parastatal businessess included in the Enterprise and Establishment Register

(EER) held at the Central Statistics Office (CSO). This register uses a variety of sources, e.g. registration of companies, trading and manufacturing licenses, road transport licenses and telephone directories, as a basis.

> "No attempt is made to cover the many small businesses that cannot be identified from the above sources and are often termed the 'informal sector'. It is thought that current employment in this 'informal sector' is relatively small." (Central Statistics Office, 1986b, p.3).

However, some informal sector activities are covered by the employment surveys, i.e. hawkers that have obtained permits, licensed businesses and taxi enterprises.

Nengwekhulu (1987) points to the number of different definitions of informal sector in Botswana. For example,

> "some scholars on Botswana informal sector economy define informal sector economy in terms of size. Hence they include within the informal sector economy small scale enterprises..... the majority of researchers and scholars etc. seem to define an informal sector economy in terms of registration and licensing.... its own methodological problems because it means that even hawkers, street vendors etc. become included in the formal sector economy." (p. 1-2).

The informal sector in Botswana is usually thought of as consisting of three different categories, i.e. traditional agriculture, domestic work and self-employment. Through censuses, the Labour Force Survey 1984/85 and agricultural surveys, there appears to be more information available regarding traditional agriculture than regarding domestic work and self-employment. However, the figures on number of people involved in traditional agriculture varies considerably between sources. The third category, i.e. self-employment, consists of a number of different activities, which in the Botswana context basically can be divided into four groups (Mbere, 1985):

A. Making goods for sale
B. Performing services for money or goods
C. Gathering/Hunting/Agriculture
D. Hawking/Vending/Selling to others

For historical reasons self-employment activities in Botswana have been fairly undeveloped. Subsistance farming, hunting and gathering were the main activities for the majority of the population until recent times. Open market places, so common in other African countries, have not existed in Botswana, and street vendors are a very recent phenomenon.

IV. Policies

Employment creation has been a major focus of the Botswana government since the early 1980s. Thus in 1981 a Presidential Commission on Economic Opportunities was established. The report of this commission (Republic of Botswana, 1982) formed the basis for the National Policy on Economic Opportunities accepted by Government in 1982. Economic opportunities were defined by the commission as "the possibilities each Motswana has to utilise Botswana's national resources to improve his living standards by his own efforts" (p. 4).

The policy involves an emphasis on private sector activities. It stresses that government services cannot substitute for opportunities for Batswana to earn a better living for themselves; this also should include the poorest citizens of the country.

Though there are some recommendations related to the promotion of informal activities, e.g. the curriculum to include education for self-employment, deregulation in relation to hawkers and vendors, and support to the agriculture sector, the main thrust of the report was on employment creation in the formal sector.

The Financial Assistance Policy (FAP) introduced in 1982 uses government funding for the promotion of productive activities. The support consists of non-repayable grants over a short initial period. However, counterpart funding is required and few informal sector people would benefit from this assistance as they cannot provide the necessary financial input.

V. Size of informal sector

The size of the informal sector needs to be seen in relation to the formal sector and the total labour force. The labour force has been defined in different ways in various documents. Thus Ghai (Republic of Botswana, 1971) did not include women in his analysis of the Botswana labour force. The 1971 Population Census (Republic of Botswana, 1972) included everyone aged ten years or over, whereas in the 1981 Census (Republic of Botswana, 1983) those twelve years and above where included in the labour force. In 1981 the upper age limit was set at 65 years for males and 60 for females. Other documents, i.e. the National Development Plan, the Labour Force Survey and the National Manpower Planning Development reports have used lower age limits varying from eleven years to seventeen years. This made Kann et al. (1988) conclude that:

> "The definition of the labour force is important in the context of unemployment. By excluding women, or certain age groups, or a combination of both, in the definition of labour force, *it is possible to make the unemployment problem appear less than it actually is*." (p.22).

Thus when, in Table 1, we provide estimates of the informal sector these varying definitions of the labour force have to be kept in mind.

The various sources providing data for 1981 are far from consistent. It is for example doubtful that there was a total of 24 500 persons self-employed, considering that the Labour Force Survey in 1984/85 estimated less than 7 000 in that category.

The figures for traditional agriculture are far below those estimated in agricultural surveys and reported in Table 2.

Table 1.
Estimated Labour Force and Employment in Botswana
1981 - 1996

	1981	1986	1996
I. Labour force	316 500	377 200	544 600
A. Employment	281 500	309 600	414 000
1. Formal	97 400	129 600	209 000
2. Informal	184 100	180 000	205 000
a. Trad. Ag.	143 800	140 000	140 000
b. Other	40 300	40 000	65 000
Domestics	15 800	20 000	25 000
Self-empl.	24 500	20 000	40 000
B. Unemployment			
1. Number	(35 000)	67 600	130 600
2. Rate	(11.1)	17.9	24.0

Sources: 1981 figures from National Manpower Development Planning 1985 (Employment Policy Unit, 1985) and Census 1981; 1986 and 1996 figures from National Manpower Development Planning 1987 (Employment Policy Unit, 1988).

Table 2.

Employment in Traditional Agriculture 1980 to 1986

Year	Family Labour	Hired Labour	Total
1980	186 700	60 200	246 900
1981	188 400	74 700	263 100
1982	163 000	52 100	215 100
1983	139 200	47 550	186 750
1984	139 500	46 650	186 150
1985	149 600	70 300	219 900
1986	155 700	79 700	235 600

Source: Central Statistics Office, 1986b

A.Traditional Agriculture

Agriculture has always been the main activity of people in Botswana, with cattle being considered economically more important than arable farming. Cattle has provided substantial foreign exchange earnings and therefore also received various forms of government subsidies. Periodic long periods of drought make arable farming a very uncertain source of income, which is confirmed by employment figures for this sector for the first half of the 1980's, a period of prolonged drought Table 2.

The origin of the above data is agricultural surveys. These figures are considerably higher than those used by manpower planners. A number of documents have reported underemployment among the Botswana labour force especially in traditional agriculture. Thus the majority of people reported as working in traditional agriculture are not full-time occupied with this task.

The total number of people working in traditional agriculture dropped dramatically from 1981 to 1984. From 1985 there was an increase not least in the number of people hired as opposed to family labour. This was probably partly related to government subsidy schemes related to the drought.

A study of workers in the agriculture sector is currently being undertaken for the government by the National Institute of Development Research and Documentation of the University of Botswana. The study is intended to form the basis for consideration of a minimum wage policy within this sector.

B. Domestic Servants

The figures available regarding domestic servants are mostly estimates. Thus the current National Development Plan (1985-91) estimated 13 500 domestic workers in 1979. The number was believed to have increased to 20 000 in 1984/85. However, the Labour Force Survey reported 16 200 in 1984/85.

The problem with enumerating domestic workers is that, in many cases, a young girl working as a domestic servant in a relative's house is not regarded as an employee, but as part of the family, when in fact she is carrying out the same tasks and working under the same conditions as a domestic worker.

A similar study to that mentioned regarding minumum wages within the agricultural sector is also underway concerning domestic workers.

C. Self-Employed.

This is the sector in which government believes there is "a potential for significant employment growth during the next decade" (Employment Policy Unit, 1988). This is also the sector within which it is believed that the many young school-leavers will have to create their jobs (Kann et al., 1988).

As to the size of this sector there is considerable confusion. The Labour Force survey reported, as indicated above, less than 7 000 people in the informal sector in 1984/85. The current National Development Plan estimates 30 570 that same year and the National Manpower Development Planning document 1987 estimates approximately 20 000 self-employed workers in 1986, but recognises that this estimate might be high.

VI. What do those who are self-employed do?

The study by Mbere (op. cit.) gives a picture of what kind of work is carried out by those who are self-employed following the four categories indicated earlier.

A. Making Goods for Sale

1. Beer making/parties
2. Tin smithing
3. Leather craft
4. Black smithing
5. Making wood products
6. Alcohol other than beer
7. Cooking
8. Biltong making
9. Tailoring, dressmaking
10. Knitting
11. Brick making
12. Other concrete products
13. Pottery making
14. Basket making
15. Board work

B. Performing Services for Money or Goods

16. Mechanic
17. Musician
18. Electrical repairs
19. Radio repairs
20. Accounting
21. Funerals
22. Welding
23. Traditional doctor
24. Watch repairs
25. Scribe
26. Transport service
27. Moruti
28. Carpenter
29. Painter
30. Plumber
31. Builder
32. General handyman
33. Health care
34. Field clearing
36. Hand stamping
37. Ploughing service
38. Milling by machine
39. Water fees
40. Fencing
41. Typing
42. Well digging

C. Gathering/Hunting/Agriculture

43. Food gatheriing/selling
44. Milk or sour milk
45. Wood selling
46. Honey
47. Cow dung gagathering/selling
48. Building materials
49. Fence poles/droppers
50. Thatching grass
51. Hunting
52. Poultry/eggs

D. Hawking/Vending/Selling to others

53. Buying phane for resale
54. Selling crops (not grown by self)
55. Selling fruits (not grown by self)
56. Selling Chibuku
57. Selling bottled beer/spirits
58. Selling other groceries (soap, candles, sweets, etc)
59. Selling other goods not self-made
60. Others

There is no information regarding how many people are involved in the different activities listed above. Neither is there any information available regarding to what extent civil servants and others, who are in full-time employment in the formal sector, are also involved in informal sector activities or how many people are engaged in several informal activities simultaneously.

VII. Some previous studies

A Social and Economic Survey in Three Peri-Urban Areas in Botswana, 1974

This survey was carried out in peri-urban areas of Gaborone, Francistown and Selebi-Phikwe in 1974. Five per cent of the males in the sample and nine per cent of the females were self-employed. Only nine percent of these were involved in service type of work, whereas 48% were in manufacturing and 43% bought goods for resale (fruits, beer, animals etc.). The great majority (90%) operated from their own peri-urban home. (Central Statistics Office, 1974).

B. Employment and Labour Use in Botswana

In the late 1970s a major consultancy on employment opportunities was undertaken (Lipton, 1978). Among other things the role of 'labour-intensive investment projects', 'opportunities for informal wage employment and self-employment', and 'rural incomes from traditional agriculture and associated subsistence activities' were considered in the context of employment opportunities. The main recommendation was regarding a full employment strategy to be implemented by 1988. The report has had quite some impact on later employment strategies, but the white paper originally expected did not materialise for various reasons.

C. Informal Sector Businesses in Four Botswana Communities.

This study, which was quite extensive, was carried out in 1983 and covered Maun, Mochudi, Francistown and Selebi-Phikwe. The purpose of the study was two-fold, i.e. "to understand the nature and activity of small family-based businesses" in the four communities selected, and "to make proposals for improving the productivity and employment-creating capacity of these and similar businesses" (Alexander et al., 1983, p. iv). Thus this study focussed on informal sector businesses.

The study identified nine general categories, namely, retail sales, drinks, service, clothing, transport, repair, manufacture, construction and handicrafts. A slightly higher proportion of females than males were found as business owners, especially in the two villages (as opposed to the towns) included in the study.

D. Molepolole Incomes and Employment Survey

The main finding of this study is that there are in fact very few employment opportunities in Molepolole, a district centre and major village. Regarding informal sector employment the study states:

> "There were 13 males involved in the informal sector and 134 females; 120 of the females were in beer brewing" (Mbere, 1985, p. 13).

Traditional beer brewing constitutes an important source of income for women in Botswana. The establishment of a modern brewery in Gaborone around 1975 was followed by the establishment of bottle stores all over the country. This, in combination with prolonged drought, has led to a decline in traditional beer brewing and consequently a decline in income for many women.

E. Non-agriculture, rural, informal activities

A study of non-agriculture, rural, informal activites is at present being undertaken by the Department of Economics at the University of Botswana.

VIII. Conclusions

Against the very meager information available regarding the informal sector in Botswana the high hopes placed on its possible future role in employment creation is rather astonishing. If in fact it is possible to promote informal sector activities and to prepare young people for such activities considerably more information is necessary as a basis for possible intervention.

IX. Practical exercises

Participants will spend one day carrying out field work in Gaborone. The main objective is to obtain a feeling for the informal sector in an urban area and to propose suggestions regarding information to be collected in a later study.

The purpose of this future study is to estimate, if the expectations regarding the role of the informal sector in employment creation are indeed realistic. We are also interested in finding out to what extent people already involved in informal sector activities can be used as resource persons in preparing young people for work in this sector.

Participants will be divided into pairs, each pair including at least one Motswana (for translation purposes). A short background questionnaire and maps of areas to be covered will be provided.

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Chapter 13(A)

An exploration of the informal sector in Gaborone
Results of an "informal survey"

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Introduction

The presentations on various aspects of the *Informal Sector* by Dr K. King, Dr U. Kann and workshop participants created intensive discussions, and it was agreed that time had now come to consider the informal sector in manpower planning activities. It was also agreed that, in order to carry out planning within the informal sector, more information was needed. None of the participants felt that the information available in his or her country was sufficient for planning purposes.

As part of the informal sector module participants made an "informal survey" of the informal sector in Gaborone. Informal sector activities are of fairly recent occurrence in Botswana, and not very well developed. The informal sector *appears* to be growing fairly fast, but little is actually known, as no large scale research has been carried out.

Organisation of the field work

Participants were divided into pairs or groups of three, with one Motswana (or Setswana speaking person) in each group for the purpose of translation and geographical guidance. Eleven different areas of the city had been identified as centres of informal sector activities.[1] .

Each participant had a detailed map of Gaborone and the area to be visited. Participants were allowed to choose which area they wanted to cover, but a certain monitoring was exercised in order to obtain a fair geographical coverage. Each participant also received P15[2] to cover transportation and lunch costs.

Content of the Survey

No questionnaire or interview schedule was provided and participants were encouraged not to take notes while interviewing. It was agreed to try to obtain some background information (age, marital status, children, education, previous employment or work experience etc.), present activity and, if possible, earnings. However, all groups were not necessarily going to obtain the same kind of information. The survey was intended to be of an exploratory type. The purpose was to obtain basic information for discussion, and some background for a possible later, more comprehensive, survey.

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[1] Gaborone Station, Bontleng, African Mall, Main Mall, BBS Mall, Self Help Housing Agency area 1 and 2, Lobatse Road Industrial Area, Gaborone West, Old Naledi and Broadhurst.

[2] 1$= 2Pula (approx.)

As a preparation for the survey, and as an introduction to a life story research approach, participants were shown a videofilm containing an interview with a female small scale entrepreneur from Lesotho[3].

Impressions

It is not possible to make a statistical analysis of the information collected as, deliberately, no common questionnaire or interview schedule was agreed upon. Ten groups submitted written reports as requested. What follows are extracts from these reports. They should be treated as impressions of the informal sector in Gaborone rather than as hard core research findings.

"Some kind of petty activity was fairly widespread, but much of it was *very small scale* - so small that it wasn't easily seen at the first glance. Thus a woman was involved in Shake Shake; butchery; and occasional handicraft, but the only sign of these three activities was a little stringy piece of meat on a tree. Our impression was that Shake Shake[4] and butchery was a popular combination for which there was apparently no need for a license. But presumably this leads to a good deal of competition."

"There did not appear to be a great deal of fabrication of metal and wood products - at least in the area we covered. This may be because those pursuing those activities are clustered elsewhere, or because they were carried out at different times of the day than we were there."

"The mixture of informal and formal sources of income in the same family was a common feature. Several of those we talked to were in households which were including both formal and informal sources. For example, the fat cake business was being run by a man who was a relatively low level of industrial worker, and who sold the cakes himself after work. During the day he paid a girl with very little schooling to make the cakes."

"The *quality* of the operations was rudimentary. The standard of elementary hygiene was very low in the butchery - no gauze to keep flies off."

"There was much evidence of building and renting of rooms. One of our sample had 5 regular rooms which would be let at P30 - 40 per month each. A lot of building materials were being moved about whilst we were there, some of them being carried in formal sector transport (established contractors). There would clearly be major differentials within the informal economy - between those renting a room, and carrying on a little trade, and those plot owners who would be able to combine renting rooms, with an informal activity, and with possibly a formal sector activity also."

"We were not clear to what extent the licence system was getting in the way of trade. Our impression was that licenses were not needed for Shake Shake and petty butchery (though the latter is very surprising if true), but they were needed for small shops and for vegetable selling (the latter would be hard to police). Apparently licences were not required for manufacturing."

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[3] One Woman's Story (Lesotho). Educational Videofilms, Gaborone (1989).

[4] Selling commercially made thick cereal beer.

"None of those we asked had considered making an application for FAP (Financial Assistance Policy). In one case, the woman thought that it would involve far too much paper work; in the case of the furniture maker, it would be problematic to put up his side of the money needed."

"The majority of stalls were owned or operated by women. Many of the stalls sold food."

"Apart from the display of the items for sale, the operators didn't seem to do anything to attract potential buyers e.g. at one of the stalls several items did not have prices on them. The shop stall assistant did not even come closer to check if we needed assistance."

"One of her children was studying at the University of Botswana, the second who had passed COSC was working for the (parastatal) and her youngest was in Form II. Her hope was that these children would assist her after they finished school."

"Their profits were just enough to maintain their families. They had been at this business for many years. It had been very difficult for them to improve their facilities. Many school leavers that acted as assistants soon left to establish their own stalls."

"Used to be assisted by daughter now working in the bank."

"Woman about 40 years old. Never married, with 3 children. She started selling home brewed beer and food in 1973. Managed to get a SHHA[5] plot and built three rooms which are being rented, and later built herself a house in front to stay. A daughter who has been to secondary school, now employed, helped building the house. Gets rental income at P40 per room and month."

"Woman in her early 40s. Five years of primary education. Started selling *chibuku* (local beer) to supplement husband's income. Managed to build the house they are staying in, but now the husband restricts her from carrying out any business even though he is unemployed."

"Man in his late 30s. Has had no formal schooling. Was trained as a mechanic-cum-welder through apprenticeship under a man from Zimbabwe. Has obtained on-the-job training in South Africa and received certificates for this. Has had some employment with construction companies and panel beaters. Now owns two minibuses. Does part-time jobs during the weekends and is assisted by his children. Has hoped to open his own garage, but has no security and can therefore not obtain a loan."

"From our visits we realised that the informal sector in Botswana is in its infancy. For example, compared to other countries in Africa, the informal activities are fewer, with fewer people involved. The participation of men in food (cooked) business was almost non-existent.

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[5] SHHA = Self Help Housing Agency

There was no selling of herbs and traditional medicines, no people to help carry loads for other people for a fee, no begging, no con-men with gambling gimmicks *and most important of all, the people engaged in these activities were not aggressively pursuading people to buy their wares*. They were very timid compared to sellers in other countries. For example, in some cases, it was not easy to see the owner of the items that were on display because he or she was not sitting near them and was silent."

"We interviewed a man who owns a grocery shop of a sort as well as doing the repairs of shoes. He put up a temporary structure where his wife sells a few items of grocery while he repairs some pairs of shoes under a tree. The couple has no children. He started his business last year after finishing his terms of contract in South African mines. His grocery shop does not bring enough profit but it is better than nothing. As regards the shoe repair, he gets a reasonable profit, but he has a problem of people's failure to collect finished shoes within the specified time period. Some people pay cash for repairs, some deposit and others pay when collecting the shoes. No one was taken to task for failing to pay and collect finished shoes within the agreed period."

"The other man we interviewed also worked in South African mines and he decided to come back home after completion of his last term of contract. He never attended school but he learnt how to read and write at the mines. He has three children, one is at the cattlepost looking after cattle while the other two are attending school. His shoe making (repairing??) business is doing very well. With the profit that he made he managed to send his wife to Sebele to learn sewing. As soon as the wife completes her course, he will go to learn carpentry and carving. His aim with the training is to make a bigger business, which will give him more profit."

"The last person we interviewed was a woman who sells fruits. She is single with four children, all attending school. She buys assorted fruits from the wholesaler and sells them for profit. She gets P2.00 profit per day and the total earnings per month are just enough to keep herself and the family going. She stated that Council issues them with vendors' licences. In the future, after having accumulated enough funds, she hopes to be able to construct a temporary structure. She understands English and keeps accounting records of her small business."

"Kgomotso has a food stall at the ... Market. Born 1947, she is the first born of four children. She is married with five children. One child works for a government department, one has done Form III and three are in English Medium schools[6]. She is trying to find a place in a senior secondary school in Zimbabwe for the child who has done Form III, but not obtained a place in a senior secondary school in Botswana.

Kgomotso did not pass her Junior Certificate. She did a Primary Teachers course after which she taught for one year. For five years she did a number of jobs including being a revenue clerk.

Fifteen years ago she then started her food stall business. She started by selling a plate of food with fried meat and liver (R0.35 per plate). Now she sells a variety of foods: rice, mealie pap, samp, sorghum meal with stew, fried meat, liver, seswaa etc. (P2 to P3 per plate).

She has some very reliable customers who buy on credit and pay at the end of the month. She has had very few cases of bad debts. Her customers are from a cross section of the society. She runs her business between 5.15 a.m. and 9.00 p.m. every day. She has some workers and she pays them an average of P90 per month. She pays P13.00 per month for her stall and she does not pay income tax. She has applied for a commercial plot and she plans to have a restaurant if she gets the plot. She would however not leave her food stall business. She does not regret getting out of teaching and she does not dream of going back into formal employment. Though her husband is an accountant with ..... she feels that she contributes more to the family income than he does."

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[6] English Medium schools are private schools with high fees.

"The lady we interviewed is about 50 years old, the last born of ten children. She did not go to school as she had to help at home. In the early 1970s she was working in a Take Away restaurant. One day as she was waiting for the bus she saw some women cooking food and making tea for sale. They were not really tidy in their work. Most of the time they were sitting down. She got an idea. She was going to start doing the same type of thing but she would be neat and she would stand most of the time. When she got home she went to the wholesalers, bought a box of meat and stomach, a crate of cabbages, 4 primus stoves and some crockery and the following day she started her business.

When people got off the early morning train their attention was caught by this woman standing under a morula tree and they found she was selling fried meat and liver. She made P40 just that morning. A young man promised to bring her customers who he wrote in the book, and at the end of the month he would collect money for her. At the time she was paying P0.50 per month for rent. In 1976 she moved to the Council stalls - paying P13 per month.

In 1979 she changed to grocery. Things did not go so well as she found out that with grocery business one needed to know how to read and write. She then changed to selling fruits (in 1984), but in 1985 went back to grocery. Some young man volunteered to help her with stock taking and book-keeping for two weeks. She stocked her little place with goods worth P1 500, bought on credit from the wholesaler. In a week's time she had paid back the money. Then her business really started doing well. During month end days she makes an average of about P700 per day (profit??).

In 1988 she attended a week's course run by the Ministry of Commerce and Industry on Basic Record-keeping and Business Management.

She has four employees. The manager gets P350 per month, the assistant gets P150 and the other two, P100 each.

Early 1989 she started a small general dealer's shop in .... Even if this will flourish, she is not going to leave her stall."

Conclusions

Although this was a very informal study carried out during a couple of hours, several interesting issues appear, most of which would be worth while pursuing further. A survey supplying some hard core data is badly needed. However, such a survey could gain from being combined with more in depth case studies using a life line research approach.

Combination of formal and informal activities.

It would be interesting to find out the extent to which persons employed in the formal sector of the economy also have a foot in the informal sector, to supplement income. This can take the form of evening and weekend work in that own area of work, but also the form of employing somebody else to run the small business e.g. making and selling fat-cakes.

This combination of formal and informal work is an increasing feature in many African countries. In Botswana, the combination of formal employment and cattle rearing is fairly common, but little is known of other activities carried out in combination with formal sector employment.

Multiple informal activities.

Many small traders and others working in the informal sector prefer not to "place all eggs in one basket". Thus, many are involved in several different activities. However, more information is required regarding the economic advantages of this approach. Is it so that, rather than adding to the total earnings, one of the activities is financially supported by the other.

Petty activities.

Some informal activities are more visible than others. Thus, when undertaking research in this field it was felt that the researchers need imagination and intuition in order to be able to identify some of these very small scale informal activities.

Education

Very few people with education above primary level were identified in the survey. Thus, at present, work in the informal sector does not appear to be a solution for unemployed Junior Certificate leavers. In fact, many of those interviewed did not have a full primary education and several did not have any formal education at all.

Gender

The participants found many more women than men involved in informal activities in Gaborone. In particular, it was pointed out that men were not involved in preparing or selling cooked food. They sell fruit, vegetables, and meat, but not cooked food.

Production and manufacture activities

Non-Batswana participants commented upon the rather few activities of manufacturing type that they identified.This is of importance as the Botswana Government's Financial Assistance Policy (FAP) is limited to production/manufacturing activities. Cooking of food and selling it is not considered as production. Thus, it appears the majority of the people included in the small survey would not qualify for FAP, which they anyhow do not know very much about.

Rental of rooms

This is a an area worth further research. There is a enormous shortage of accommodation in Gaborone, the fastest growing capital in the world. Government cannot keep up with the demand for housing and is relying on the private sector to do its share. It appears that people letting out rooms in Self Help Housing Agency areas usually have at least 3 or 4 rooms in their backyard for rental. The going rate for such a room is P30 - P40 (mid 1989). The economics of the undertaking needs to be further looked in to.

Non-assertive selling

Maybe the most interesting issue of all, identified by the Non-Batswana participants, was the fact the most people selling goods of one kind or another did not put any effort into the selling. In fact, it was sometimes difficult to buy. This was explained by Botswana participants as having deeply rooted cultural background. In Botswana society you do not sell, you give, expecting to be given an equivalent treatment in return, when you yourself are in need.

Substantial variations in income

Only few of the reports contained any information regarding the earnings of the people interviewed. Sometimes people just could not provide the information, sometimes they did not want to provide it and sometimes the participants found it difficult to ask about the earnings. However, a woman with three sewing machines reported that she earned approximately P70 per day (P1 500 per month). This should be compared with another woman, selling fruit, making P2 only per day. The latter was keeping financial records!

It is quite clear that many of the hawkers and vendors do not really know how much money they are making from their business. But, as long as they make enough money in order to keep the business going, they continue.

Informal Sector workers as informants

It should finally be mentioned that the participants mostly found the interviewees very cooperative and willing to share their experiences. Only in a few isolated cases did some suspicion arise.

Informal sector workers are often dismissed as not knowledgeable enough to contribute to development of their own sector. It is hoped that the experience of the participants from the small informal survey carried out during the workshop, and this account of that exercise will help promote the involvement of workers from the informal sector in any future development efforts in this field.

Chapter 14

Education and productive work

by

Wim Hoppers

Education with Production (EWP) as a concept refers to a situation whereby productive work is an integral part of a programme of general education. Although essentially EWP can also serve to broaden courses in vocational training or constitute a basis for workers' education in places of work, it mostly refers to the integration of production into the curriculum of primary and secondary schools. The common understanding of this productive work is that it concerns the actual production of goods and services that are useful to the school or the surrounding community (Gustafsson 1987). The activities take place either on the school premises or in farms and factories outside the school's control.

EWP considers the involvement of all pupils in production as central to the learning process. It has a cognitive dimension in that pupils are to develop a broad range of practical skills, get acquainted with relevant aspects of the world of work and learn about the application of science and technology in processes of production. EWP also has an important affective dimension as it aims to develop an interest in and respect for (manual) work, instill desirable social values and habits, and bring the school closer to the realities of everyday life. In poorer countries production is also meant to contribute towards the running costs of educational institutions and serve equity by increasing access for larger numbers of youth. Beyond these aims a central concern in EWP is that the integration of learning and working is a basis for altering the nature of education and contribute towards the development of a new society.

EWP already has a long history. While it is closely related to polytechnical education, the concept is not exclusively Marxist. It has been applied in educational experiments in 19th century Europe and is currently finding acceptance in countries as far apart in geographical and ideological terms as Vietnam, Lesotho and Panama.

1. EWP and vocational education

In its widest meaning of work-oriented education, vocational education incorporates EWP. With its emphasis on broad cognitive, moral and social objectives, EWP is not meant to train pupils in job-specific skills or improve their chances in the labour market but rather to enhance the overall value of general education as a preparation for life. Thus EWP can be regarded as a variant of prevocational studies, laying a sound foundation for subsequent specialist vocational training (Atutov 1986). It has a distinct method in that its benefits are not merely gained through practice periods in supplementary craft subjects or excursions to places of work, but through the actual involvement in all stages of the production process and correlating these to other subject areas in the curriculum.

EWP is not identical to "work experience programmes", which have multiplied rapidly during the last decade, particularly in Western countries. Although their aims vary a good deal they generally stem from a pragmatic concern about the articulation between schools and the labour market, and the resulting need to help youth learn more about employment opportunities and develop social life skills necessary to obtain and hold a job (Jennings 1987a). The programmes rarely make work a central vehicle for learning or the manipulation of its organization and methods an experimental ground for social and economic transformation.

2. Traditions of EWP

EWP has it roots in traditions originating in different parts of the world. In different degrees these have influenced contemporary advocates of production in schools. Particularly in developing countries a practice of eclecticism has made that interpretation may exist side by side or receive attention at different times.

EWP has been strongly influenced by the concept of polytechnical education with its emphasis on the need for a direct interchange between theory and practice. Productive work would help to understand the basic theories underlying technology and engineering, guarantee a close connection between schools and the world of work and provide an introduction to the main trades (Pfeifer and Wald 1987). The combination of education and work in socialist countries also led to other policy variants such as the post-revolutionary practice of engaging all students in some form of labour in factories and farms in direct contact with workers and peasants and the establishment of half work study centres especially in economically backward areas, for example those in China (Thögersen 1987).

The fate of the work component has depended much on the dynamics in individual socialist countries. One trend has been to shift the emphasis of production practice from places of work to farms and workshops within the schools (Soviet Union, Cuba) or to specially designed polytechnical centres (German Democratic Republic). The educational requirements have thus led to a degree of institutional separation even where integration with work was the aim (Lauglo 1983). There are also debates as to how far a broad-based labour education can be reconciled with a new interest in vocationalization, as in China and Soviet Union (Atutov 1986).

In Western educational thought education and work have tended to remain rather separate domains, each with its distinct organization and functions. There has been a trend to relate learning much more to the immediate environment and create opportunities for the development of a wider variety of skills and aptitudes. The more recent depression in the labour market justified a more explicit attention to the world of work itself. But the various programmes have generally stopped short of blurring the boundaries between schooling and work and they have not interfered with the conventional philosophy and organization that underlie learning in schools.

Educational reforms in many developing countries have been a reaction to the traditions of Western, especially European education. A strong motivation for allocating a central place of productive work in schools was that it symbolized a link with the traditional local communities in contrast with the academic and urban features of the imported colonial system. In line with populist traditions physical work came also to be seen as a valuable instrument for personal development: a source of moral fibre, self-reliance and civic virtue (Lauglo and Lillis 1988). Populist sentiments were often mixed with direct inspiration from socialist thinking, especially the moral aspects of labour education and the linkages between theory and practice. Above all a central attraction of EWP was the very output of production which could help expand education through a reduction of unit costs. Indeed, interest in the economic aspects of school production has been closely associated with the changing fortunes of national development.

In countries where the EWP tradition has been strongest, such as India and Tanzania, a national philosophy emerged incorporating the above elements. Basic education, as developed by Gandhi, emphasized traditional village crafts (especially spinning) as a method for character building, instilling basic skills and attitudes of self-reliance and mobilizing youth for rural reconstruction. Although during the 1960s the idea was abandoned, later it inspired a modern revival in the form of socially useful productive work. This has become an attempt to reconcile the Gandhian concept with the requirements of current socio-economic developments.

In the case of Tanzania's education for self-reliance the aims are similar to those in India. Education is to serve the needs of the majority living and working in rural areas and should help to transform the inherited colonial structures. Productive work or self-reliance activities in schools became the embodiment of the new philisophy. Pupils should not be exempted from the activities of the local community, and through involvement in work develop socialist attitudes and habits, contribute to the upkeep of the school and increase the national income. Self-reliance activities and classwork are meant to feed each other, so that academic work becomes practical, and productive work becomes educative. Schools, therefore, should become economic communities as well as social and educational communities (Nyerere 1968). Like in many other developing countries production takes place on the school's premises, mostly in the form of agricultural work. Some attention is given to handicrafts like woodwork or basketry.

In the last two decades EWP has been accepted as educational policy not only in Africa's avowedly socialist countries, such as Ethoipia and Mozambique, but also in countries with a more mixed economy like Zambia and Zimbabwe. Here the concerns are more diverse. In Zambia all educational institutions were to establish production units since 1975. But while originally there was greater emphasis on production as an enhancement of general learning, current interest stems much more from its perceived potential to substitute for parts of government's subsidies in education (especially non-salary recurrent costs) and to prepare youth for a future of self-employment. In Zimbabwe the ideological inspiration is stronger, but EWP is limited to only a handful of schools while mainstream attention is on more pragmatic efforts to vocationalize the rapidly expanding secondary system.

Diverse considerations have also guided EWP programmes in the Commonwealth Caribbean. Although the hope of ensuring a greater balance between academic and practical work as well as a degree of self-sufficiency for the institution has been a general objective, attention to wider social objectives varied in accordance with the political environment in which EWP was introduced. New attitudes and values, linked to the school's role in creating a new society were prominent in Jamaica under the Manley government and in Grenada under Maurice Bishop (Jennings 1987b).

3. The practice of EWP

An important weakness of education with production is that while much has been written about its nature, underlying philosophy and relevance, the literature investigating actual processes and outcomes is relatively scant, notably with respect to EWP in developing countries (King 1985a). A picture that emerges from available reports is one of many problems and constraints in implementation, and of only limited success against more failures. This is especially pronounced in educational systems where EWP has not received consistent political protection, has not been introduced throughout the system and/or has not enjoyed the internal technical support 2necessary to help sort out the many practical aspects or organization and management, resource mobilization, curriculum development, teacher education and school community relations.

Often EWP programmes, even if well conceptualized, were not given much time to develop adequately before being officially abandoned or substantially modified. Jamica is a case in point. Where protection has been more continuous, as in China and India, over time reinterpretations of the combination of learning and working have led to severe criticisms of existing policies. The credibility of the concept suffered in consequence, even though the critique may have been more related to the needs for adjustment to new socio-economic circumstances than to failure of old policies to achieve their objectives.

In quite a few countries the philosophy of EWP has had to compete with other concepts of education which were more in line with the realities of socio-economic structure. Where EWP has been introduced in single institutions or existed as a separate educational channel alongside conventional schools there have been many reports about parental resistance to manual labour, partly because such work tended to be associated with the drudgery of village life from which schools were perceived to be an escape, partly because mainstream academic education was clearly more highly rewarded in society. However, in many developing countries the widespread depression in the formal economy may well improve the standing of EWP programmes. There has been evidence all along of individual institutions succeeding in many of their objectives, including the development of practical skills and positive attitudes towards work and a substantial degree of self-reliance. Progress appears to be related to high quality teaching, inspiring leadership, a shared believe in the value of combining work and study and a collective pride in the institution's outstanding features. This very achievement, however, also made them a subject of local political controversy. Examples have been: Swaneng Hill Secondary School in Botswana, Jose Marti Secondary School in Jamaica, and the Mayflower School in Nigeria (Van Rensburg 1974; Jennings 1987b; Solarin 1972). The contradictions between EWP and the prevailing social and economic structures have led many scholars to be sceptical about the feasibility of EWP in non-socialist countries or denounce it as retarding development (for example Zachariah 1988).

Implementation problems are very conspicuous in countries where EWP has been introduced throughout the system of general education. Available studies point to weaknesses in the conceptualization of EWP, lack of clear policy guidelines, lack of management and technical skills in the schools, lack of adequate curriculum materials, insufficient support for procurement of tools and materials and for the marketing of produce, and difficulties in working out suitable assessment procedures. Such problems greatly affected the process of EWP, particularly the integration of production into the curriculum, the production of useful and good quality items, the involvement of pupils in decision making and the interaction with the local community. As result these problems have compounded the external factors affecting EWP and made that such programmes scored low on their pedagogical as well as their social and economic objectives (Sinclair 1976, 1977; Komba and Temu 11987; Jennings 1987b), Where, however, in a systematic manner efforts are made to communicate effectively with headmasters, teachers and community leaders, there is evidence that more can be achieved: for example through the Rural Education and Agriculture Programme (REAP) in Belize, the Self Help Action Plan for Education (SHAPE) in Zambia, the Polytechnical Education Support Programme (PESP) in Tanzania and the "Nouvelle Ecole" programme in Benin.

4. Issues in EWP

Despite the problems and constraints EWP remains strong in socialist countries and is highly popular among governments in the developing world. In more countries it has become an attractive way to reform education along lines that appear consistent with indigenous culture, while at the same time helping to reduce the costs of education and prepare youth for self-reliance. Therefore the prospects for EWP look good. But research shows that there are basic issues that need urgent attention. One concerns the expectations of what EWP is to achieve, and this is related to the role of EWP in different socio-economic and political structures. In countries that are not socialist or aim to develop socialist structures EWP is given a task to contribute significantly towards personal and ultimately towards social transformation; but not towards accommodation to existing realities. There is an underlying assumption here that schools have a degree of autonomy in their interaction with society, potentially exerting a strong influence on the development of skills, attitudes and values that are not congruent with prevailing practices. This challenge puts a heavy burden on the organizers to secure sufficient protection for such programmes as well as resources for their implementation. Furthermore, even if curricular objectives are achieved, school leavers may not necessarily have an advantage in the employment market. Thus consideration may need to be given to arranging follow-up assistance with non-educational inputs; a consequence drawn by only a few programmes, such as in Botswana through the Brigades and in Zimbabwe through school leaver cooperatives (Gustafsson 1987).

A second issue concern how to combine education and work without one undermining the benefits of the other. As was noted there is a trend to establish clear institutional boundaries between "normal production" and production for educational and training purposes. Even when supervized by the school the question remains how far the production process can be compromised before it loses its meaning as a genuine learning experience. Scholars have pointed to the inherent contradictions between conventional learning through school subjects with their distinct structures, sequencing of concepts and controlled instructional settings, and learning through (production) practice which follows the tenets of experiential learning and is by definition less amenable to manipulation (Lauglo and Lillis 1988; Atutov 1986). More experimentation is needed to achieve an optimal balance and degree of integration.

A final issue related to the nature of productive work to be carried out by pupils. To what extent should it be in line with local activities or introduce pupils to varieties of work of which they have less direct knowledge? What concessions should be made to availability of resources and access to markets? In countries in the North as well as in the South there is a tendency to involve pupils in lower and intermediate grades in handicrafts, agricultural activities, or needlework (King 1985a; Pfeifer and Wald 1987). Sometimes this choice is influenced by philosophical or educational considerations, other times by expediency. Sex role stereo-typing in the allocation of practical work has remained a persistent phenomenon and has further limited and educative value of work (Jennings 1987b). Some burning questions in this regard are: what exposure can be reconciled with local resources and social tolerance, what place is there for commerce and service activities, and in what ways can the advantages of low technology handicrafts be combined with an introduction to more advanced technologies, including computer aided ones? Further interchange between theorists and practitioners should help to clarify these and other concerns in education with production.

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Chapter 15

Gender, education, work and earnings in Botswana[1]

by Ulla Kann

I. Introduction

Education's role in improving the general life of the poorer groups in society and minority groups, including women, has been stressed numerous times. In most industrialised countries there is little difference between the basic education achieved by men and women. Thus the literacy rate for men and women in such countries is fairly equal. In Third World countries the situation is different and there are in fact very few such countries that have equal literacy rates for women and men. Botswana is exceptional in that females show a somewhat higher literacy rate than men (Kann & Taylor, in print).

My basic concern while writing this paper has been that increasingly, all over the world, women need access to cash income. "Man - the breadwinner" is increasingly being disclosed to be a myth. While female participation in formal employment might be increasing in some countries, this is not the case everywhere. And, even if women increasingly participate in formal employment, they experience various forms of difficulties and discrimination, both when attempting to gain access to and after obtaining, formal employment. For example, for some reason women tend to earn less than men.

This paper was sparked off by a report from an employment survey carried out by the Central Statistics Office in Botswana in 1985 (Republic of Botswana, 1985) where it was stated that "female employees earn on average more than males" (p.6). Is it really so that, because women in Botswana traditionally have had access to primary education to a greater extent than men, they also receive higher salaries than their male counterparts?

I am starting with a brief overview of the educational status of girls and women in Botswana as related to that of boys and men, I proceed to portray gender differences in involvement in formal sector employment and finally, I provide some information about gender related earnings differentials.

However, I will initially give some theoretical basis for gender inequalities in work and especially in earnings based on Anker and Hein (1986).

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[1] An earlier version of this paper was presented at the IIEP/BREDA/NIR Regional Intensive Training Workshop on Education, Employment and Work. University of Botswana, Gaborone, 26 June - 14 July, 1989.

II. Theories of gender inequalities in work

A. Neo-classical theories

Differences in labour productivity is the main explanation provided by neo-classical theories for the fact that women usually earn less than men. Factors such as family responsibility, physical strength, education, training, hours of work, absenteeism and turnover are supposed to reduce women's productivity. Thus, lower levels of human capital among women make them earn less.

B. Theories of labour market segmentation

These theories are a variation of neo-classical theories assuming that labour markets are divided into different segments within which neo-classical principles still apply.

The most common of the segmentation theories is the dual labour market theory. Distinction is made between *primary sector jobs* which provide a good salary, security and opportunities for career advancement and *secondary sector jobs* which are characterised by low pay, no security and little or no likelihood for promotion. Absenteeism and turnover tend to be more frequent within the secondary sector, where a higher proportion of women are normally found. However, the reason for the higher absenteeism and turnover may be explained by gender differences in occupations and not necessarily by typical female characteristics. Also persons working within secondary sector jobs are commonly used as a labour reserve. In times of economic depression it is workers in this sector that are laid off first.

Though theories of labour market segmentation provide some insights into sex inequalities, no adequate explanation of discrimination against females in employment and work has been provided by any economic theory. The discipline of economics accepts cultural gender differences as given and thus cannot explain them. We therefore have to turn elsewhere for such explanations, for example to gender and feminist theories.

C. Gender theories

There are a number of different gender and feminist theories of various origins. Very simplified they can be divided into Marxist and non-Marxist approaches. However, in our present context the most common denominator is that gender theories do not accept that women's position in home and society is given. A clear distinction is made between sex differences (with their origin in biological and physical differences between males and females) and gender differences (based on cultural and social differences). Thus women's reproductive role is not queried, but the cultural and social discrimination within her productive sphere that follows is much debated by gender researchers. The traditional division of labour is thus a major focus of investigation. One aspect of interest here is women's unpaid labour, especially in connection with child care, but also in giving service to husbands and older relatives.

III. Gender and education in Botswana

A. General

From Kgatleng district, Schapera (1940) reported

> "In 1932 there were some 950 pupils at school. In 1937 the number had advanced to some 1 400 (said to be approximately 50 per cent of the children of 'school-going age'). Of these, however, no fewer than 1 170 (83 per cent) were girls)" (p. 235).

The boys spent most of their time herding cattle at the cattle-posts, which usually were far away from the village and thus from the school. However, even if girls attended school to a greater extent than did boys, they usually left school after only two or three years as their help was needed at home.

The above is the historical background to the fact that, even in the late 1980s, there is a slightly higher proportion of girls than of boys in Botswana primary and junior secondary schools.

Table 1 below shows the percentage of girls enrolled at various levels of education since Independence in 1966.

Table 1. Female enrolment in formal education

Primary Year	Junior Schools	Senior Secondary Schools	General* Secondary Schools	Tertiary Secondary Schools	Insti-tutions
1939	64%				
1945	64%				
1950	64%				
1955	62%				
1960	58%				
1963	57%				
1966	56%			45%	
1970	53%			47%	
1975	55%			53%	34%
1980	55%	59%	41%	56%	41%
1985	52%	55%	41%	53%	42%

* = Combined Junior and Senior Secondary Schools.

Source: Bechuanaland Protectorate, Annual Reports of the Education Department. Republic of Botswana, Educational Statistics, 1970, 1975, 1980, 1985.

Compared with other countries in the region Botswana has a fairly high proportion of females at tertiary level. However, it should be noted that for specialised disciplines such as engineering, medicine and veterinary science, no training facilities are available in the country, and students are thus sent to universities outside Botswana for studies in these fields. This is elaborated upon further below.

B. What About Science and Technology?[1]

Vocational and professional training in Botswana was rudimentary before and immediately after Independence. Teacher training and basic vocational training had been provided in South Africa until the mid-1950s, when apartheid influenced the education system in that country and some of the training institutions traditionally used by Batswana were closed down.

Using educational statistics from 1970, 1980 and 1986 the enrolment figures of the main vocational/technical/ professional training institutions in the country were analysed (Table 2). The main purpose of this analysis was to investigate gender changes in enrolment patterns.

1. Agriculture

The Botswana Agricultural College enrolled a total of 100 students in 1970. All were male. Two courses were offered, i.e. one in agriculture (82 students) and one in animal health (18 students).

Customarily, the women in Botswana cater for the fields, whereas the men manage the cattle. We could thus expect that women would be enrolled in the agriculture course at BAC and men in the animal health course. This was, however, not the case in 1970.

By 1980, however, some women had managed to become enrolled in the agriculture course at BAC, but still no women had entered into the field of animal health. In fact, I tend to remember that there was a policy that girls should not be admitted to the animal health course at BAC. By 1986 one quarter of the students in agriculture as well as animal health courses at BAC were females.

The BAC has been heavily funded by USAID over the years. An evaluation of its support was carried out in 1986. This evaluation found that there had been certain difficulties placing the female agriculture extension workers in the districts and it was therefore suggested that the maximum intake of female students to BAC should be cut to 10% (Andersen & McBreen, 1986).

2. Technical

The Botswana Polytechnic was established in 1974 as the National Centre for Vocational Training (NCVT). I was involved in the selection of the first group of students and remember the embarrassment expressed by the administration when they found that *girls* had endeavoured to apply for courses in bricklaying and carpentry. There were no *toilet facilities* for females! Nobody had envisaged that girls would apply to this technical training institution. Nobody (at least not the expatriate architects and planners) had made the connection between traditional house/hut building (traditionally done by women, not men) and bricklaying and carpentry.

Even today, 1989, the few female students at the Botswana Government Polytechnic, (36 in number), are still accommodated outside the campus, i.e. at BRIDEC. There are, however, plans to build hostels for female students.

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1. This section is based on a paper by Kann (1989) entitled "Some Facts and Figures on Girls, Science and Technology in Botswana".

Table 2.

Enrolment in Vocational/Technical Courses 1970, 1980 and 1986 by Gender.

Course	Year 1970		Year 1980		Year 1986	
	T	F%	T	F%	T	F%
Agriculture (BAC)						
1. Agriculture	82	0	75	15	106	26
2. An. health	18	0	88	0	83	27
Sub-total	100	0	163	7	189	26
Technical						
1. Botswana Polytechnic	-	-	193	0	537	8
2. ATTS	-	-	-	-	115	1
Vocational						
1. Bricklaying	254	0	452	0.4	393	2
2. Carpentry	91	0	167	0	277	6
3. Draughtsmen	-	-	14	0	25	4
4. Electrical	20	0	30	0	23	0
5. Farming	86	0	-	-	10	-
6. Forestry	-	-	7	0	4	0
7. Machining	-	-	34	6	3	0
8. Mechanics	45	0	30	0	183	1
9. Panelbeating	-	-	-	-	4	50
10.Plumbing	-	-	11	0	22	9
11.Printing	-	-	-	-	10	100
12.Secretarial	10	100	-	-	45	89
13.Textile +	52+	100	82	50	23	100
Homecraft	97	100	-	-	-	-
14.Welding	-	-	24	0	23	22
Sub-total	674	24	890	6	1047	11
Health						
1. Health Ass.	16	0	-	-	-	-
2. Com. H. Nurse	-	-	-	-	8	100
3. Enr. Nurse	127	100	381	96	130	87
4. Fam. Nurse	-	-	-	-	13	92
5. Gen. Nurse	-	-	-	-	86	93
6. Reg. Nurse	72	99	247	94	219	88
7. Dental Th.	-	-	3	100	19	58
8. Lab. Th.	-	-	21	76	31	26
9. Midwife	20	100	-	-	115	94
10.Pharm. Th.	-	-	24	83	36	44
Sub-total	235	93	679	94	657	83
Teacher Training						
1. TTC	283	53	844	83	1317	84

Source: Republic of Botswana, Educational Statistics (various years).

Since its start in 1974 the Botswana Polytechnic has had a few female students enrolled. By 1986 the female students constituted 8 percent of the total student body. At ATTS, in 1986, one percent or one student of the total enrolment, was a woman.

Rogers in her book The Domestication of Women (1980) mentions that the 'no facilities' argument is often used in order to keep girls/women out of education and training.

3. Vocational

The first brigade was initiated before independence in Serowe by Patrick van Rensburg. Training in textile production, homecraft and secretarial skills catered for female trainees.

Table 2 illuminates the 'division of labour' envisaged by the brigades at this time. Boys were enrolled in bricklaying, carpentry, farming and mechanics, whereas girls trained in the fields of textiles and secretarial work. Approximately one quarter of all trainees in the brigades were girls in 1970.

Ten years later only 6 percent of the trainees in brigades were females. The Government was no longer providing subsidies for training in the textile field (why?) nor for secretarial training. The number of trainees in textiles had increased from 52 in 1970 to 82 in 1980. However, by 1980 boys had encroached in this traditional female domain. Half of the textile brigade trainees in 1980 were males. We believe they were involved in screen printing.

By 1986 the trainees in textiles had been reduced to 23, all females.

The overall enrolment of females increased from 6 percent in 1980 to 11 percent in 1986. Girls are now taking up training positions in bricklaying, carpentry, draughtmanship, auto- mechanics and panelbeating.

In 1988/89 we observe new (donor-supported) efforts by the brigades to attract females into technical/vocational training courses.

4. Health

In the beginning of the 1970s, almost one hundred percent of the trainees in health education were females. By 1980, males had entered into some fields of health education, i.e. mainly as laboratory and pharmacy technicians, but also as enrolled and registered nurses. Thus, by 1980, 6 per cent of all trainees at NHI were males.

By 1986 17 per cent of all trainees at NHI were males. Boys are encroaching on the more technical fields i.e. dental therapy, laboratory technology and pharmaceptical technology. But, we also find that in 1986 six percent of trainees in midwifery were males.

5. Teacher training

To be a primary school teacher was typically a male job before independence. In fact, teacher training was one of the few professional training possibilities that were open to Batswana at that time. The situation had started to change by 1970. Thus, in 1970 53 per cent of all students at teacher training colleges were females. By 1980 this figure had increased to 83 per cent and remained almost the same (84 per cent) in 1986.

6. Tertiary level

The University of Botswana has five faculties, i.e. Social Science, Humanities, Education, Science and Agriculture. The Faculty of Agriculture is newly established and enrolment figures are therefore not yet available.

As mentioned, the majority of all professional training in science and technology, e.g. engineering, medicine, veterinary science, takes place outside Botswana at universities and other training institutions. Figures available from the mid-1970s indicate that about one quarter to one third of all students sent abroad for training were females. This is slightly lower than the participation by females at the University of Botswana at that time. There is no indication that girls are less willing to go abroad for further training. However, "some (male) officers have argued that women to a greater extent get married and drop out during their studies and this should be a reason for not sending women abroad." (Kann, 1980, p. 28). A more likely explanation of the lower participation of women in training abroad is that such training to a great extent is in the fields of science and technology, that is, training which traditionally is male dominated.

Educational statistics after 1983 do not provide enrolment figures at the University of Botswana broken down by sex. Figure 1 below shows total enrolment for the four faculties for 1977, 1980 and 1983.

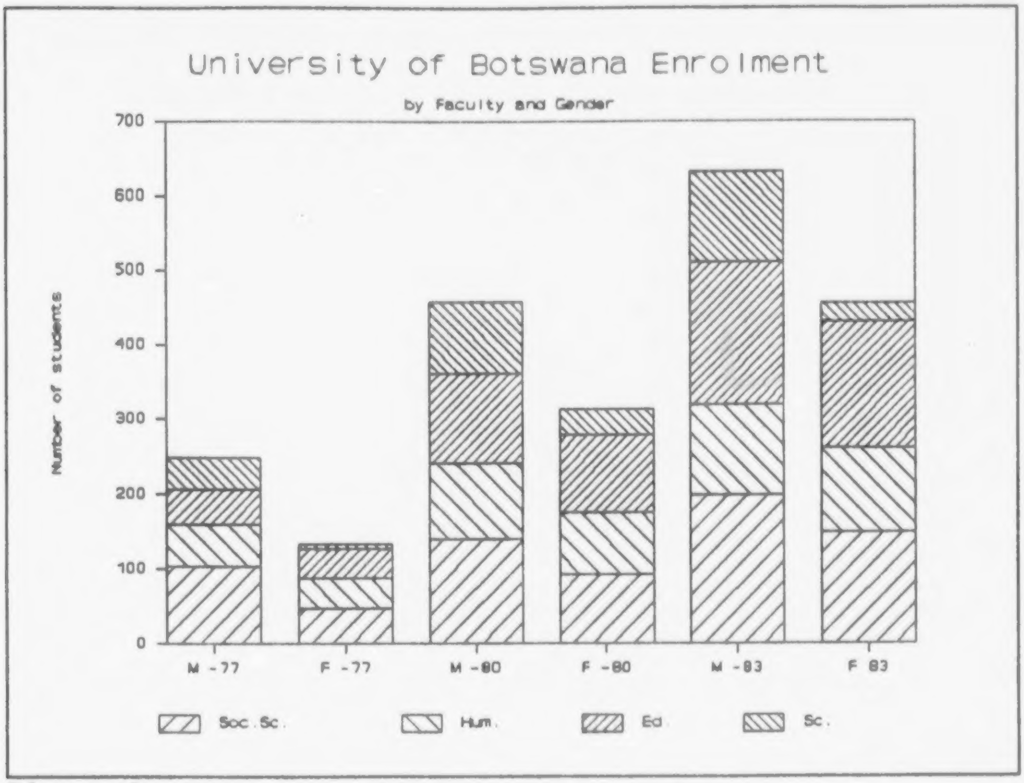

Figure 1.

Only 7 per cent of all Batswana students at the Faculty of Science were females in 1977. By 1980 this figure had increased to 25 per cent, to decline slightly to 23 per cent by 1983.

At the Molepolole College of Education science course in 1989, approximately 40 per cent of the students were females.

C. Educational Performance by Boys and Girls

I have not, so far, attempted to explain why the proportion of girls decreases as they proceed in the educational system. There is every evidence that parents in general are positive to their children going to school. This attitude applies to both sons and daughters. Kann et al. (forthcoming) points to the fact that, if anything, boys are handicapped when it comes to primary school enrolment as they are required by parents to assist with cattle herding. In a few parts of the country girls are married off fairly young and are then barred from continuing formal education according to the law. But, even at the time when junior secondary schools, especially the so called private secondary schools, charged substantial fees, parents sent their girls to school. Thus, there is at the moment no evidence from Botswana that parents withhold their daughters from formal education opportunities.

However, there are other reasons for why girls do not proceed to senior secondary and higher education to the same extent as boys.

First, girls perform equally well with boys at primary level (Kann, 1978), but "boys outperform girls in almost all subjects at the junior secondary level" (Duncan, 1989, p. 200). Thus, in the selection to senior secondary level, which is based on the Junior Certificate, girls are handicapped because of poor performance and therefore do not get admitted.

Second, even at junior secondary level girls drop out of school to a much greater extent than do boys. The main reason for girls dropping out of school is pregnancy (Kann & Mugabe, 1989).

Third, there are more further vocational/professional education opportunities open after junior secondary in what are traditionally female lines of training, e.g. primary teacher training and nursing training. However, there is no evidence that girls favour these training opportunities before senior secondary education.

What happens in school is not isolated from what happens in society at large. Thus, the gender-typing that takes place in school is clearly influenced by, e.g., gender-typing within the labour market. Duncan (1989) in her recently published book on Engendering School Learning, based on research carried out in Botswana, concludes that

> "...one of the reasons for gender differences in school performance is the fact that school subjects have different gender types which give rise to differential achievement through their influence upon the attitudes of students towards these subjects..... The inter-relationships among subject gender types, attitudes towards school subjects, and subject achievement were found to be generally stronger for girls than boys." (p. 175)

and further, that

> "The results of this study lend support to the argument that studies in science are at odds with the gender role perceptions of adolescent girls." (p. 195).

IV. Women and men at work

In traditional Tswana society, work tasks were strictly divided between men and women. The skills required to carry out these tasks were carried over from one generation to another; from mother to daughter and from father to son. Though formal education and training institutions to an increasing extent are taking over this training function, men and women in Botswana still largely do different types of jobs.

Employment and labour force surveys (Central Statistics Office, 1986) provide some information regarding the different fields of work in which men and women in Botswana are occupied. Data from the 1984/85 Labour Force Survey will first give us an overview of the total labour force Table 3.

The total labour force (employed and unemployed) consists of 53% women. Of all women working, 30% are in the formal sector, 60% in traditional agriculture and 10% in domestic jobs. Women constitute 64% of all unemployed. Of all men working, 47% are in the formal sector, 51% in traditional agriculture and 2 % in domestic service.

Of all persons employed in the formal sector (Private, Central and Local Government) 38% are women according to the Labour Force Survey. This is somewhat higher than the approximately 30% reported by the 1986 Employment Survey and the 31% females in the cash-earning population in the 1981 Census.

Table 3. Labour Force Participation by Sex

	Males	Females	Total	% Females
Employed	139 409	135 444	274 853	49%
Private Sector	43 700	22 819	66 519	34%
Central Gov.	16 991	13 323	30 314	44%
Local Gov.	4 933	4 168	9 101	46%
Trad. Agric.	71 121	81 539	152 660	53%
Domestic Service	2 664	13 595	16 259	84%
Unemployed	33 354	59 742	93 096	64%
Total labour force	172 763	195 186	367 949	53%

Source: Labour Force Survey 1984/85, Central Statistics Office

The figures from the 1984/85 Labour Force Survey thus give some indication that women to a greater extent than men work in lowly paid jobs in traditional agriculture and domestic service. Considering the high participation of women in traditional agriculture, the earlier mentioned low enrolment of girls at the Botswana Agricultural College is somewhat amazing.

The figures provided in tables 4 and 5 below refer mainly to what is commonly called the formal sector. One figure needs special explanation, i.e. the high proportion of women working within what is classified as professional and technical jobs. Within this category we find teachers and nurses, both traditionally female occupations. Women are only to a very small extent involved in productive/industrial work (classification 7/8/9 according to the ILO ISCO code). The above trends are common in most developing countries (Anker & Hein, 1986).

Unfortunately most older employment surveys have not provided breakdowns for males and females. The major emphasis, understandably, has been on analysis of citizens and non-citizens employed in the formal sector.

A comparison with the 1981 Census indicates increased female participation for most occupational groups. However, the Service sector included domestic servants in the 1981 Census and figures are thus not completely comparable.

Table 4.
Estimated Number of Paid Citizen Employees, March 1986.
Occupation Grouped by Sector.

Classification	Male	Female	Total	% Female
Prof & Tech	4 772	9 373	14 165	66.2%
Admin & Man	1 352	553	1 904	29.0%
Clerical	8 964	9 123	18 166	50.2%
Sales	2 568	4 929	7 496	65.8%
Service	10 709	6 912	17 696	39.1%
Agricultural	3 819	357	4 192	8.5%
Other (eg. Prod)	48 453	4 716	54 190	8.7%
Not stated	255	195	524	37.2%
TOTAL	80 892	36 158	118 333	30.6%

Source: Employment Survey, March 1986. Central Statistics Office

Table 5. Proportion of all Employees in Different Occupations

Classification	Female	Male	All
Prof & Tech	25.9	5.9	12.0%
Admin & Man	1.5	1.7	1.6%
Clerical	25.2	11.1	15.4%
Sales	13.6	3.2	6.3%
Service	19.1	13.2	15.0%
Agricultural	1.0	4.7	3.5%
Other (eg. Prod)	13.0	59.9	45.8%
Not stated	0.5	0.3	0.4%
TOTAL	99.8	100.0	100.0%

Source: Employment Survey, March 1986. Central Statistics Office

V. Gender differentials in earnings

A. *Can we trust the statistics?*

In both developed and developing countries available information shows that "on average women earn less than men" (Anker & Hein, Op. cit., p. 102).

The Employment Survey (Central Government Sector) March 1985 reported that average monthly cash earnings for men in permanent and pensionable positions was P441 and that for women in the same positions P519. Also the Labour Statistics Bulletin 1986 (Central Statistics Office, 1986) reported that in the formal sector men in Botswana on the average earned less than women. (Table 6).

Is this earnings differential a reflection of the high female participation rate in primary and junior secondary education in Botswana, providing women with more "human capital" than men? Or is there some other explanation to this phenomenon? Do women in Botswana indeed earn more than men? Of course not. But it should be admitted that it is fairly unusual that even on the average women earn more than men. The Labour Statistics Bulletin also recognizes that this situation is rather unusual and elaborates:

> "Table 6.6 shows a very misleading statistic. The first figure shows that average males are paid P260.91 and average females P269.40. Women are paid more than men. This is not so and shows the limitation of a simple arithmetic mean. As will be noted in the rest of the table, men are paid more than women for almost every other characteristic. It is simply that there are very large numbers of men in the very low skill jobs and they drag down the male average below the female average. Formal employment does not contain many women and in particular excludes the large number of women in relatively lowly paid private domestic service. If they were included the female average would drop considerably." (p.62).

Table 6. Average Citizen Monthly Earning by Gender

	Male	Female
1985 Employment Survey		
Permanent & Pensionable	441.42	519.18
Education Sector	454.23	350.54
Industrial Class, Temporary etc.	214.80	219.26
Total Central government	342.39	371.81
1986 Employment Survey		
All Sectors	260.91	269.40

Source: Employment Survey, March 1985, Central Statistics Office.
Labour Statistics Bulletin, 1986. Republic of Botswana, Central Statistics Office.

B. Also in Botswana women earn less than men.

The age-earnings profile in Figure 2 uses data from private and parastatal sectors in the 1986 Employment Survey.

It clearly shows, that for each educational level women earn less than men and, that women never catch up with men salarywise.

The same survey, however, includes other interesting information regarding gender and earnings. For example, when earnings are related to amount of work experience we find that females with no work experience start off with lower earnings than males, but with increasing work experience females get higher compensation than males (Table 7). Again, the picture is probably not as uncomplicated as it appears. A simple bivariate analysis is not powerful enough for the problem we are investigating. Unfortunately the raw data was not available for further analysis at the time of writing this paper.

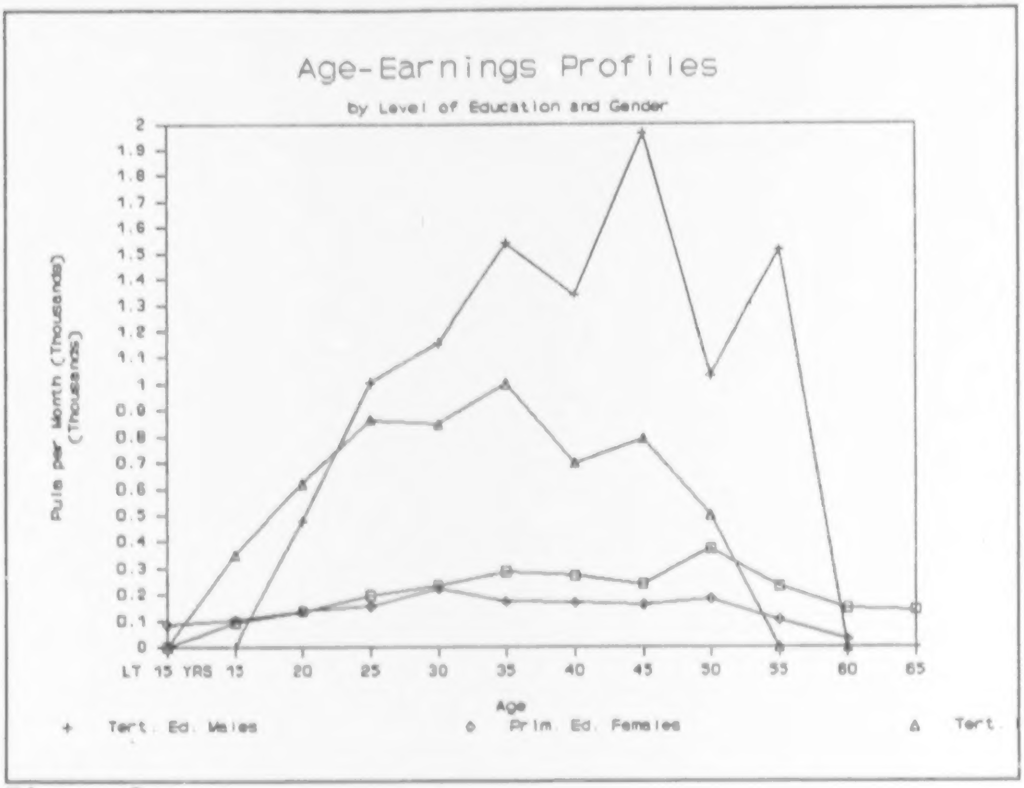

Figure 2.

Table 7. Average Monthly Earnings by Work Experience and Gender.

Work Experience	Male	Female
None	128.19	121.09
Some but under 1 yr	160.35	164.30
1 yr but under 2 yr	195.34	222.15
2 yr but under 5 yr	245.94	263.98
5 yr but under 10 yr	323.38	311.16
10 yrs or more	434.93	452.47

Source: Labour Statistics Bulletin, 1986. Republic of Botswana, Central Statistics Office.

It should be noted that the above information refers to formal sector employment only.

Investigating the economy at large, for example including formal as well as informal sector activities, we find an even bleaker picture. The 1985/86 Household Income and Expenditure Survey (Republic of Botswana, 1988) provides the following information regarding mean income by highest level of education of head of household:

Table 8. Mean Income by Highest Level of Education.

Head of Household	No school	Primary	Secondary	Higher
Urban				
Male	226.77	416.82	1149.64	2208.95
Female	95.25	208.49	462.28	*
Rural				
Male	105.59	190.32	595.74	775.74
Female	58.52	109.01	412.89	*

Source: Central Statistics Office: Household Income and Expenditure Survey 1984/85.

For each level of education male headed households have higher income than female headed households. The gender differences in income are greater in towns than in rural areas. However, it has to be noted that the above table shows total household incomes and not individual incomes.

VI. Conclusions

Women in Botswana have traditionally had greater access to basic, formal education than men. The present study does not really answer the question of whether Botswana's educated women receive corresponding benefit from this education. It indicates, however, that even when women have acquired some of the human capital required according to neo-classical theories, they do not obtain earnings on par with men. There is some evidence of gender based labour market segmentation in that the participation rate of women is higher in lowly paid sectors as traditional agriculture and domestic service. In addition, unemployment is higher among women than among men.

Available data have not allowed a proper multivariate analysis, which is required in order to go behind the existing bivariate tables provided in official statistics. Also we have mainly dealt with formal sector employment. More information about earnings of women working in agriculture and in domestic service will soon be available in a not yet published study carried out for the current Presidential Commission on Incomes Policy.

Finally, I am proposing a regional study on gender and earnings. Such a comparative study would be able to highlight, and put into perspective, the impact of education on earnings in Botswana better than this paper.

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Chapter 16

An occupational information system for Botswana

by Marcia L. Nkambwe[1]

Introduction

During this workshop on Education, Employment and Work you have heard reference made to Botswana's two major manpower problems: a large surplus of unskilled labour and a severe shortage of skilled manpower. The formulation of appropriate employment and manpower development strategies to tackle these problems requires a solid information base which links data from the labour market and from the education and training system in an effective way.

The Central Statistics Office is currently developing an Occupational Information System (OIS) for Botswana for this purpose.

Users of the occupational information system

The primary users of the OIS are likely to be planners and administrators responsible for education and training programmes, manpower development plans, income and employment policies, and national development plans. Other potential users include private sector enterprises, for developing internal manpower plans and training strategies; employment services agencies, to evaluate local labour market conditions; agencies involved in investment promotion, to provide labour market information to potential investors; career masters and vocational guidance counsellors, to inform students and job-seekers about training opportunities and job prospects in various occupations; employers' and workers' organisations, to formulate policies and programmes in the light of the relative surplus or shortage of workers in various occupations; and academic researchers and consultants, to analyse issues related to education, training and work.

General structure of the occupational information system

Currently occupational and related information is available from a variety of sources (employment surveys, household surveys, work permit applications, tracer studies, administrative data from training institutes, etc.), each having different underlying purposes, methodologies, and outputs. The data are usually tabulated according to specifications for a target group of users, and reports are often issued with a number of tables, graphs, and diagrams which may be of interest to these users.

Other potential users of the data may have limited access to the published reports, or the published information may not be in a form which is very useful to a particular individual. The data may be too aggregated for the purpose at hand, or the user may be interested in analysing relationships which are not captured by published tables. Although users may request the Central Statistics Office, for example, to generate additional tables which have not been published, the recompilation alternatives are limited. Furthermore, the process of bringing together all relevant occupational and related information could be very tedious for individual users and they may not have access to critical information needed to link the various sources of data. A need exists to link relevant findings of various surveys and other sources of occupational and related information in a logical way, using a common conceptual framework and common classification schemes. At the same time, the unique characteristics of each data collection method must be identified, together with any special characteristics which may limit or enhance the usefulness of the data. The data should be available in a format which allows users to access the information needed for planning purposes in an efficient and effective way. The system should be flexible and responsive to the availability of new data and to changing requirements of the user community.

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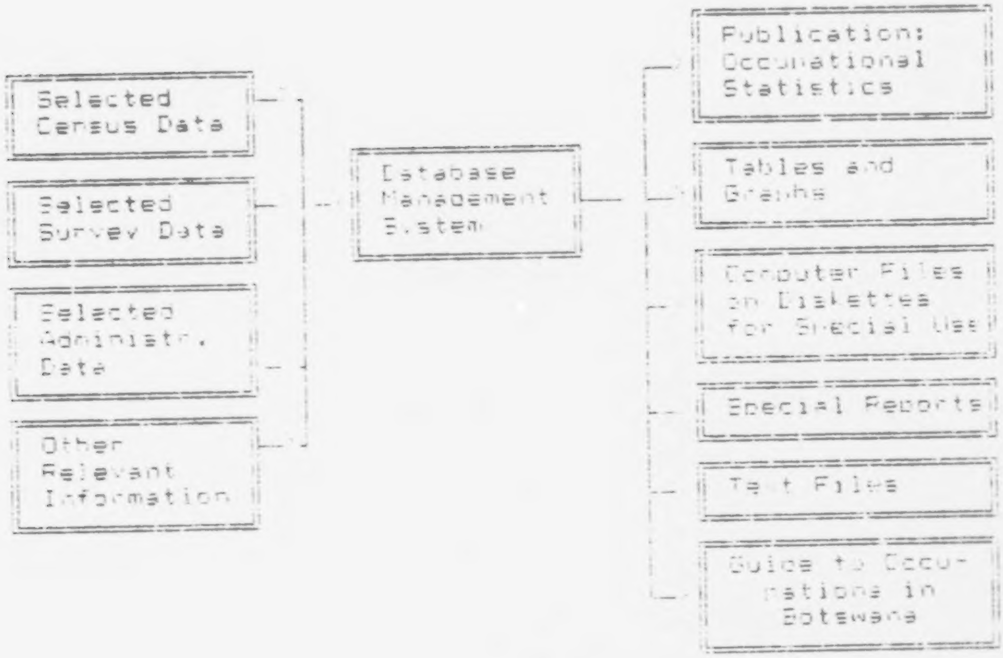
An approach to occupational information presentation and management which satisfies the above needs is the Database Approach to Occupational Statistics illustrated in Figure 1.

Figure 1. Database approach to occupational statistics


Selected Census Data
Selected Survey Data
Selected Administr. Data
Other Relevant Information
Database Management System
Publication: Occupational Statistics
Tables and Graphs
Computer Files on Diskettes for Special Use
Special Reports
Text Files
Guide to Occupations in Botswana

The boxes on the left represent the various sources of occupational and related information. These sources are discussed in greater detail in a later section of this paper. "Administrative Data" includes, for example, information provided by academic institutions and vocational schools. "Other Relevant Information" would include summaries of survey methodologies and bibliographic sources.

The database approach to managing occupational information permits systematic data entry, indexing, sorting, correcting, adding to, deleting from, and calculating from data records.

Data can be located through key methodological, demographic, locational, socio-economic, and other characteristics. Data subsets can be extracted for use in spreadsheet, graphics, and statistical analysis packages to suit the special needs of users.

Suggested outputs of the proposed Occupational Information System are summarised in the boxes on the right side of Figure 1. They include a statistical publication on Occupations and/or a section in the annual *Labour Statistics Bulletin*; a collection of tables and graphs, available on diskette to interested users; data files on diskette in unit record form for use by planners and others who wish to conduct their own statistical analyses; summary presentations of occupational data for use by vocational or employment counselors; a newsletter informing potential users of the availability, structure, and outputs of the database and of options for updates; special reports requested by particular users (e.g. occupational profile of a particular industry, occupational distribution of women in the workforce); text files on diskette describing information of interest to users of occupational and related data (definitions of labour market concepts, comparisons of survey methodologies, annotated bibliographies of relevant literature, etc.), organised by subject matter; and a *Guide to Occupations in Botswana* for use by vocational and career counselors or by direct participants in the labour market.

Proposed elements for the occupational information system

The following is an outline of proposed data elements for the OIS:[2]

I. **Occupational Demand**
   A. **Current Occupational Demand** - stock of jobs in an occupation
      1. **Current Occupational Employment** - number of jobs currently filled in an occupation
      2. **Job Vacancies** - number of actual jobs available to be filled within a particular occupation
   B. **Dynamic Variables that affect Occupational Demand over Time**
      1. **Demand Due to Growth**
         a. industrial growth/decline - projected growth in industry employment over some time period
         b. changes in industry staffing patterns -occupational composition of an industry may change over time, causing employment in some occupations to grow while employment in other occupations declines
      2. **Replacement Demand** - demand needed to maintain a given level of occupational employment over time; a source of job vacancies, but doesn't produce net change in aggregate demand
         a. labour force separations - due to death, retirement, military service, illness, injury, inability to find employment
         b. occupational transfers - workers who have moved from one occupation to another

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[2] This outline is adapted from *An Introduction to Using an Occupational Information System: A Reference for Program Planning*, National (U.S.A.) Occupational Information Coordinating Committee, 1983.

        - c. out-migration - workers who have moved from one labour market area to another
    - C. **Projected Occupational Demand** = Current Occupational Demand - Occupational Separations (labour force separations, occupational transfers, out-migration) + Replacement Demand (to offset occupational separations) + Demand Due to Growth

- II. **Occupational Supply**
    - A. **Current Occupational Supply**
        - 1. Current Occupational Employment
        - 2. Unemployed
    - B. **Dynamic Variables that Affect Occupational Supply over Time**
        - 1. Occupational Entrants - individuals who gain employment in an occupation or who are qualified and actively seeking employment in an occupation over time
            - a. education/training program completers and leavers
            - b. new entrants and re-entrants to labour force
            - c. occupational transfers
            - d. in-migrants
        - 2. Occupational Separations
            - a. labour force separations
            - b. occupational transfers
            - c. out-migrants
    - C. **Projected Occupational Supply** - stock of workers who will be available at some future period of time; includes Current Occupational Supply plus net difference between Occupational Entrants and Occupational Separations

- III. **Occupational Characteristics** - information in this section of the OIS can be used to analyse the causes of and potential solutions to any labour market imbalances identified through comparing projected occupational demand and supply
    - A. **Nature of the Occupation**
        - 1. Titles, Definitions, Duties
        - 2. Machines, Tools, Equipment, Work Aids
        - 3. Materials Used, Products Made, Subject Matter Dealt with, or Services Rendered
        - 4. Related Occupations and Clusters
    - B. **Working Conditions**
        - 1. Organisational Environment
        - 2. Physical Environment
        - 3. Schedule and Hours
    - C. **Personal Requirements**
        - 1. Interests, Temperaments
        - 2. Aptitudes and Abilities
        - 3. Physical Demands and Capabilities
    - D. **Education and Training Requirements**
    - E. **Licensing, Certification & Registration Requirements**
    - F. **Earnings and Fringe Benefits**
    - G. **Employment Profile**
        - 1. Occupational Demographics
        - 2. Industrial Concentration
        - 3. Degree of Unionisation

IV. **Complementary Information**
  A. **Education and Training Auxiliary Information**
    1. Education and Training Institutes
    2. Education and Training Programmes
    3. Financial Assistance Programmes
  B. **Demographics and Economic Conditions**
    1. Demographics
    2. Labour Force, Employment, and Unemployment Trends
    3. Labour Turnover
  C. **Information Sources**
    1. Primary Sources
    2. Secondary Sources
    3. Bibliographic Sources

Data sources

Not all components of the OIS can be measured from existing data sources. In some cases, existing sources provide only partial coverage, producing gaps or inconsistencies in the data, and in other cases no data are available at all. Different sources may cover parts of the same OIS component, producing overlap or double counting in the data. Because different sources may have been developed for different specialised purposes, there may be inconsistencies in definitions of important labour market concepts, in scope and coverage, in sample design, or in other survey characteristics. This complicates the process of aggregating and/or comparing data from the different sources, and effectively linking all of the relevant data is the major challenge in developing the OIS.As a first step, a "survey" was conducted to identify sources of data for each of the proposed elements of the OIS. These sources can be grouped into the following major categories:

1. **Census Data** - The last census was conducted in 1981 and there are a number of publications based on that census which contain valuable information for the OIS. In addition, the planning process has already begun for the 1991 census.

2. **Survey Data**
   a. **Employment Surveys** - The Central Statistics Office has conducted annual Employment Surveys since 1971 to collect details on employment and earnings, labour turnover and vacancies, occupation, and, starting in 1984, training needs and conditions of work. These surveys cover formal sector employment, including, since 1985, Central Government employment.

   b. **Continuous Household Integrated Programme of Surveys** - This is an integrated series of surveys designed to provide basic demographic data on a periodic basis, along with data on specialised topics. The surveys conducted to date are:

      -**Primary Health Care Survey** (1983-84)
      -**Labour Force Survey** (1984-85)
      -**Household Income and Expenditure Survey** (1985-86)
      -**Demographic Survey** (1987)
      -**Family Health Survey II** (1988)

The Labour Force Survey was particularly relevant to the OIS since it covered the informal sector as well as the formal sector and because it attempted to measure unemployment and underemployment in the economy.

c. **National Migration Study** - This study yielded a great deal of information concerning migration patterns in Botswana.

d. **Annual Education Statistics** - The Central Statistics Office compiles annual statistics on the formal education system in Botswana, including primary and secondary schools, Botswana Polytechnic, the University of Botswana, Botswana Agricultural College, the Automotive Trades Training Centre, the Teacher Training Colleges, and the Brigades.

e. **Tracer Studies** - A number of tracer studies have been conducted in Botswana to explore the employment history of school and training programme leavers.

f. **Employment Policy Unit** (Ministry of Finance) - This unit is collecting data on enrolments and outturns of most of the formal training programmes in Botswana.

3. **Administrative Data**

a. **Work Permit and Exemption Certificate Data on Non-Citizen Employees** - These data are collected by the Department of Labour and tabulated by the Central Statistics Office.

b. **Directorate of Public Service Management** (DPSM) - DPSM developed an occupational distribution of the Permanent and Pensionable Establishment and of Industrial Class posts in the Central Government in 1988. DPSM also has data on the number of university graduates requested by employers in the private sector, data on vacancy rates in Government departments, and the numbers of graduates from the University of Botswana and from overseas universities and training institutes.

c. **Bursaries Secretary, Ministry of Education** - The Bursaries section has data on bursaries both inside and outside the country.

d. **Employment Services Unit, Department of Labour** - This unit compiles statistics on vacancies, job registrants, and migrant labourers to South African mines and farms.

e. **Manpower Planners, Various Ministries and Departments of Government**

4. **Related Databases** - A number of Ministries and Departments of Government have developed or are developing related databases, components or outputs of which can be incorporated into the OIS. The Ministry of Education, for example, is developing a computerised Education Management and Information System which will provide very valuable data on the formal education system. Madirelo Training and Trade Testing Centre has recently developed a database to monitor training and other activities associated with the recently enacted Apprenticeship and Industrial Training

Act. DPSM has a database on training institutions and programmes in Botswana, developed in conjunction with the publication *Preparing for Jobs: Training Opportunities in Botswana.*

5. **Private Sector Sources of Information** - Human Resource Managers in large enterprises can be contacted for general information about training needs and programmes. Members of the Association of Training and Development Officers can be called upon for similar information. Other labour market intermediaries, such as the Botswana Confederation of Commerce, Industry and Manpower (BOCCIM) and the Botswana Federation of Trade Unions, can also be approached to provide information relevant to the OIS.

6. **Academic Research and Consultants' Reports** - There are a number of relevant publications and reports, too numerous to list here, which provide valuable information for input into the OIS.

Current status of the OIS

The first priority in OIS development, already underway, is to design and quickly implement the Current Occupational Demand module, giving special emphasis to incorporating Employment Survey and Work Permit data. These data sources are of particular importance to Manpower Planners and to individuals who are now beginning to develop sector reports for inclusion in Botswana's next National Development Plan.

User comments on the proposed OIS are still flowing into the Central Statistics Office, and an OIS Steering Committee meeting will be convened in the near future to finalise OIS design and development priorities. It is expected that the OIS will be developed and implemented on a module-by-module basis so that interested users will have access to at least parts of the database as soon as possible.

Conclusion

Although the OIS could be viewed as a comprehensive Manpower Planning Database, the intention is that the system should serve a much broader purpose. It could just as appropriately have been called an Education, Employment and Work Information System since its scope encompasses many of the issues addressed in this workshop. One of the most important features of the database is the flexibility it will offer to potential users in analysing available data, and it is hoped that the database will provide the Central Statistics Office with an increased capability to provide information to the user community.

Workshop exercise on OIS

1. The important role which the informal sector must play in employment creation in Botswana has been emphasized in this workshop. However, very little information is available regarding the informal sector. Based on your experiences talking to individuals involved in informal sector activity in Botswana, suggest ways in which data on the informal sector might be incorporated into an OIS. Consider how you might collect data on the numbers of individuals working in the informal sector, both in urban and in rural areas, by sex, age, economic activities, geographic area,

education and level of skill, extent of under-employment and incomes. Discuss also how qualitative information on the informal sector (e.g. anecdotes collected during your field work) might be incorporated into an OIS.

2. Unemployment is a major problem in many African countries, yet, in many cases, there are no current unemployment statistics programmes. In Botswana, the best source of information about unemployment is the Labour Force Survey of 1984/85, but this source is becoming dated and there are no resources for conducting another such survey in the near future. Given the importance of estimating unemployment, suggest ways in which a country might be able to capture information on unemployment other than by conducting periodic Labour Force Surveys.

3. Consider the Occupational Supply module of the proposed OIS for Botswana. Identify, for your country, possible sources of data for each element listed under the category Occupational Entrants.

4. Many potential users of an OIS are not necessarily represented on an official steering committee such as the one described in the OIS draft proposal. However, it is desirable to arrange a system of less formal contacts for taking their views into account. Suggest some ways in which this can be done.

Chapter 17

Strategies for a better match between education and employment: A synthesis of discussions and ideas

by

B.C. Sanyal, N.V Varghese and W. Hoppers

These strategies will be discussed separately for the formal, non-formal sectors and informal sector of the economy and the education system. First we deal with the formal sector. This has two categories: (i) the formal organized sector of the economy, and (ii) the formal self-employment sector.

The formal organized sector of the economy needs a different treatment of the relationship between education and employment according to whether we are dealing with market or centrally planned economies. So we shall treat them separately.

A. Formal sector

1. The formal sector of market economies

According to neoclassical theory, education and other human capital factors can improve productivity and therefore the income of an individual. Hence to achieve improved equality of incomes, an egalitarian educational system should be planned while to improve the economic well-being of the population, the educational system should be developed according to economic needs for skills and the corresponding economic return. This theory has been the basis of employment policies in market economies, where employment is not guaranteed and economic incentives attract students to education. Thus educational planning is based on satisfying individual demand for education. However, distortions in the labour market create disequilibrium of demand for and supply of educated labour and consequently problems of employment arise. In this context, the market forces of demand and supply of manpower play an important role in educational planning through policies for wages, recruitment and promotion. Employment policies are based on manpower policy which is dependent on the types of skills needed for the development of the economy according to scientific and technological changes. These skills are related to exploration, exploitation, management and conservation of resources and are also related to negotiating capacities of the citizens of the country to establish bilateral and multilateral cooperation within the country or outside. Educational planning in these countries particularly at post-primary level and for vocational types, is oriented towards developing these skills as well as the corresponding effective and psychomotor skills for increased productivity. However, in market economies the social divisions between the working class and the middle class, and within the working class itself are likely to be reproduced by the schools; children from different social origins are likely to be sorted into economic and social roles which are related to their parents' social class standing. Furthermore, the educational system helps to produce ever higher levels of skills in the society even though these skills cannot be fully employed. Where labour unions are more powerful in capitalist societies (primarily in industrial Europe, the United States of America and Australia), schooling has tended to serve working class interest in social mobility and - very indirectly - in better conditions of employment.

The recent problems of unemployment have motivated these economies to formulate employment policies which go far beyond the capabilities of the educational and training system. For example, in some countries information systems on employment policies may be created with the objective to gather, synthesize, translate and disseminate relevant information in Member States, serving each of the responsible national ministries and agencies in their daily decision-making and aiding the Commission in its co-ordinating role at Community level. Countries may set up institutions and agencies of employment and may establish the legal framework and procedures for (i) protecting wage earners and salaried employees from dismissal, (ii) establishing and operating trade unions and employers' associations, (iii) fixing minimum wage and working week, (iv) establishing a job seekers' and unemployment benefit system, and (v) matching manpower supply and demand. They may also report on the measures adopted for employment maintenance and promotion, especially in respect of placement, counselling, training and retraining facilities, aid to the unemployed and other related measures.

The institutions of education may also determine if their actions contribute to imbalances between supply and demand in labour markets and if so, may apply corrective measures and respond to indicators of imbalance where appropriate. They should work co-operatively with employers and trade unions to determine ways of smooth transition of the youth from education to work. The higher levels of institutions should work closely with the lower ones to delineate functions, reduce overlap and ensure continuity of programme. The institution may seek to assure as much learning value as possible from work-study assignments, field experiences and internships and indicate to students how to combine subject matter interests with the development of marketable skills. Career guidance facilities also may help in the insertion of school leavers. Both the institutions of education and then employment may develop part-time student job opportunities jointly as well as staff development programmes. The employers should articulate clearly the qualities they seek in the school leavers, the educators should see that the leavers acquire and practise skills of value in employment

The countries may also set up institutions for collecting information on employment, unemployment or underemployment, as well as for carrying out research on the functioning of labour markets, transition from education to work, and career possibilities and performances. The most important of the measures for employment maintenance and creation appears to be the training component, which has direct implications for educational planning. In addition, the countries may promote vocational training institutions by giving financial aid and providing special programmes for training the unemployed and disadvantaged youth. Thus market economies try to develop employment policies and corresponding educational measures to solve the problem of unemployment. Adjustment between employment and educational development is not left to market forces of demand and supply alone since the State plays an important role in correcting mismatch.

However, the above measures may yet fail to reduce income inequality, eliminate poverty and solve the problem of unemployment. Some (the so-called dual labour market theorists) suggest that employment policies and corresponding educational planning should first be oriented towards removing social segmentation. Wage and recruitment policies should be determined by labour power not by monopolists or enterprises and should take into account the educational factors and competencies of individuals and not their social position. To remove social inequality, job mobility between different segments should be promoted by State intervention, and employment policy should be oriented towards creating primary segment jobs in the public sector (i.e. emphasizing the State role) and devising discriminatory policies for education and employment in favour of disadvantaged groups. Neoclassical theorists also accept these as policy measures.

According to the radical economists, since segmentation in the labour market and the education system are both used to perpetuate the social hierarchy, the only way to remedy the situation is to promote class consciousness. Indeed, they support the idea of conscientisation as an important function of education in order to obtain a fair employment policy. This calls for radical changes in the content, method and structure of education.

This leads us to the treatment of the strategies for matching education and employment in centrally planned economies as discussed below.

2. *The Strategy for a better match between education and employment in centrally planned economies*

In socialist societies, schooling serves socialist development strategies and vice-versa. Since the class division between capitalists and workers has been eliminated in socialist economies and the income and status differences between various kinds of work have been reduced, schools generally provide the possibility for more social mobility than in capitalist countries. Nevertheless, because the total elimination of the class structure is not only dependent on the political philosophy of socialism but on attitudes, customs and beliefs of individuals and communities, achievement in this area may not be total.

In centrally planned economies, the policy of guaranteeing education and employment to all makes the relationship between employment policies and educational planning theoretically much simpler. Educational planning is an integral part of the overall development strategy of these economies and is based on demographic factors except for education related to economic needs for skills which is based on manpower forecasts. Guaranteed employment, however, creates the problem of mismatch in quantity and quality between education and employment, creating severe problems of underemployment, especially underutilisation of training and also often leading to inadequacy of the training content for the needs of the job. In these countries, apparently, educational planning is based on sociological analysis of the different segments of the population as well as a built-in monitoring system of plans and achievements. Recent economic crises in these countries have led them to experiment with individual initiatives inherent in the human capital model of market economies in order to improve upon productivity which have corresponding implications for employment policy and educational planning.

Empirical evidence on the role of human capital and segmentation variables in income distribution shows that in most developing countries segmentation variables have less influence than human capital variables. The difficulties of relating education to employment in quantitive terms through manpower forecasts, the problem of unemployment of educated youth, the social pressure for higher education especially in developing countries (and traditionally education having much broader goals than employment), have led some countries like India to explore the possibility of "delinking" education from jobs except for some skills and disciplines.

3. *Strategies for a better match between education and employment: The role of self-employment in the formal sector*

The self employment market covers large family enterprises, farmers, independent liberal professions as well as individual ownership of firms. A large part of the self-employment labour market is in the informal sector which is discussed later. This section will be restricted to the formal, i.e. firms/farms which are registered and follow prescribed rules and regulations.

It has been argued that self employment promotes job creation because each self-employed person can provide a few more jobs for others. If a government can promote self employment through policy and if the education system can impart skills to help people to be self employed, then the problem of unemployment could be reduced. However, knowledge of the characteristics of the formal sector of the self employed labour market is very limited. Family environment, types and levels of education, individual characteristics (such as risk taking attitudes, hard work, achievement motivation, discipline etc.) and financial background are factors which influence an individual to take up self-employment. In respect to family background, it has been observed that families having self-employed heads and belonging to middle and upper income groups, are more likely to encourage their younger members to set up in self employment. Educational backgrounds conducive to self employment are degree or diploma in Commerce, Medicine, Law, Engineering and in some cases Agriculture. The Government may assist as regards financial aspects by providing credit facilities to young people for self employment, and educational systems should emphasise content to help students acquire the relevant skills and attitudes as well as provide retraining and refresher programmes for those who are already self employed. It would also be desirable to promote research on self employment and educational background.

B. Non-formal sector

In the course we have looked at a variety of innovations within three different domains: education, training and work. The innovations we were interested in concerned those which seem to provide for a more meaningful and effective transition from school to working life. This presentation will deal partly with a variety of non-formal programmes in the training and work domain, and partly with the identification of general trends affecting all three domains.

1. Training

In the training domain, only a relatively small part in most countries concerns programmes within the formal training system. Institutions tend to be few and enrolments low. Most of what goes on in the field of organised training is not controlled by a Ministry of Education or of Labour, but by private and parastatal companies, by non-governmental agencies, by other government ministries (eg. Agriculture, Youth, Women's Affairs), and by informal sector operators.

Generally we refer to training that takes place outside the formal, hierarchical system of education as "non-formal education or training". These programmes vary from skills training schemes for out-of-school youth to literacy campaigns and extension programmes. They have been defined as "non-formal" in terms of administration: i.e. that they were not controlled by the Ministry of Education or Labour, or in terms of approach and methodology: i.e. they have tended to be tailor-made programmes meeting a variety of immediate learning needs of different clienteles in a "learner-friendly" manner without putting much emphasis on "school" features like timetables, tests and certificates.

The definitions remain imprecise, however. For example, the Botswana Brigades are generally regarded as a non-formal programme (especially in terms of approach), but they are supervised by the Ministry of Education. In addition the latter Ministry has a separate Department for non-formal education which looks after "second-chance education", i.e. correspondence and evening classes.

In the area of training for youth, the most visible non-formal arrangements have been "skills training centres". As Kenneth King has pointed out many of these provisions were a result of the first school leaver crisis in the 1960s and early 1970s. The form has varied from country to country but the centres have tended to be established by NGOs, churches or community organisations as small and low-cost facilities for training school leavers in basic crafts, usually wood and metal work, building crafts, tailoring and home economics activities. The latter two were mostly for girls. The most visible and well-known programmes in the region are the Botswana Brigades and the Youth Polytechnics in Kenya. Nevertheless also in other countries a variety of such types of centres have emerged.

During the 1970s skills training centres have often been fairly successful in placing their graduates in formal sector wage-employment. Their practical training and good linkages with prospective employment helped a great deal. But it is clear that also the small size of their output balanced the united demand for semi-skilled workers.

As several countries in the region went into an economic recession, leading to a stagnation, if not contraction of formal wage-employment, this balance was upset and various institutions emerged in different countries to ensure a broader and more effective preparation for work.

Important new features have been:

- *industrial attachments*: providing work experience in medium and small scale enterprises that were likely to be interested in the graduates;
- *production units*: more practice in actual production within the centre, partly to enhance training, partly to recover costs of training;
- *business training*: efforts at developing commercial and management skills so as to improve the possibilities of starting self-employment;
- *provision of follow-up services:* this could take various forms depending on the resources of the organising agency:

- supply of tools at graduation
- building up capital through profit-sharing
- provision of seed loans
- assistance with materials, transport or marketing
- formation of work-groups or cooperatives
- provision of extension services.

Although the results have often been disappointing, experience has shown that adequate guidance during the training linked to appropriate forms of after-care services can indeed help many graduates to start on their own. The current difficulties of lack of demand in the labour market, lack of sufficient resources, lack of management skills, which have become evident in a number of countries, are contributing to agencies reviewing their experiences and searching for adjustments to help youth not only with training, but more explicitly with the creation of work.

Given the new school leaver crisis, the "soul-searching of many agencies involved with youth" and the increased political pressure to develop ways to assist much larger numbers of youth, it is worth looking at other iniatives that have been taken in different countries, each of which may have its own valuable contribution to make. We can divide these initatives into those that are "institution-based", i.e. taking place in a training environment, and those that are "work-based", i.e. taking place in an environment that is primarily an ongoing work place.

2. Institution-based programmes

- *Youth Service Schemes:* while they have had an eventful history, with many ups and downs, they are still a potent force in youth development, offering many youth a broad educational and social experience and in some cases high quality training (eg. Kenya).

- *Skills training centres:* See above.

- *Training workshops:* these are mostly small-scale institutions in urban townships or villages, whereby an agency or private individual establishes a small enterprise specifically for the purpose of training small numbers of youth as apprentices on the job. The commitment of the organisers, some extra funds and community support has often made such schemes highly successful.

- *Entrepreneurship Development Centres:* in the region this is still a relatively new phenomenon. While some entrepreneurial skills development takes place within technical training programmes, some organisations are now setting up separate centres to assist youth in the actual establishment of small enterprises (eg. the Business Management Extension Programme - BMEP - in Manzine, Swaziland, and the SELP Project (a Youth Enterprise in Wsaker).

- *Youth Development Centres:* in the region such facilities only tend to operate informally as locations where youth can meet, share experiences, obtain information about training and work opportunities. In many places churches offer some of such services.

3. Work-based Programmes

- *Youth work-groups or cooperatives:* some agencies have studied programmes aimed at recruiting youth for self-employment, whereby participants are established in a work situation and provided with technical and material support until the group can stand on its own feet (eg. Tshwaragano Enterprises, established by FEP in Botswana). Sometimes such work-groups have been linked to existing Skills Training Centres (eg. Kenya) or to secondary schools (Zimbabwe).

- *Work-experience programmes:* whereby youth are given opportunities to spend some time in a work environment and acquire basic training as well as an orientation about certain types of work. While many such schemes have emerged in developed countries, they are rare in Africa.

- *Enterprise development schemes:* in most countries organisations have been established to assist interested persons to establish themselves as entrepreneurs. In practice it appears that youth rarely benefit from such provisions as they mainly focus on experienced adults.

- *Settlement schemes:* there are still quite a few of such schemes in different countries, helping unemployed youth to settle on the land.

4. Conclusions for planning

It is worthwhile to note that the success of so many youth programmes tends to be much related to the degree of direct interest of specific agencies in youth affairs. Specialised agencies appear to do better than those that have a more general clientele. In addition many small community-based institutions can succeed because of the special attention of individual persons who act as a kind of "godfather" to youth: helping to mobilise resources, mediating for various types of assistance, etc. If anything, there is a great need for more of such persons or intermediate agencies working directly with youth to help meet their needs in training and work.

The above diversity of existing approaches can be examined on various key features which would enable governments to decide to what extent they should directly or indirectly be encouraged. In particular several of the schemes are low-cost such as different types of production-based training and the smaller types of work-based schemes. The replicability in these cases would depend much on the extent to which governments can mobilize NGOs, local authorities, community to take such initiatives. There is clearly a lot of scope for complementing larger government programmes with a multiplication of smaller projects initiated at other levels.

For planning units within government, there are several relevant points to consider:

The current *fragmentation* of programmes and projects across an array of different ministries, government and party agencies, non-governmental organisations, private and community organisations. How much autonomy do they require? How much coordination, supervision, support services should be provided? Who should do the coordination?

In what manner should governments directly *participate* in non-formal work-oriented programmes for youth? Many governments are inclined to run a variety of programmes themselves. What kinds of programmes are more suitable for government and how should they complement initiatives by others?

Many projects are initiatives by small community organisations or individuals. They seem to be highly situation-specific and *replicability* is a problem. What can governments do to increase access of youth and to what extent should this focus on having larger numbers in individual projects or on greatly increasing the number of projects following recommended guidelines?

The *imbalances* between the sexes and age groups. In the past a tendency towards formalisation of training schemes tended to shift the balance towards immediate school leavers without work experience, towards males, towards those with higher qualifications, and often towards younger persons. Now there are more efforts to capture "target-groups" that seem more promising for self-employment: youth with work experience, more females, less emphasis on qualifications, mature youth. How can we stimulate a diversity that offers relevant transition experiences to a variety of clienteles, such as school drop-outs, early inexperienced school leavers, senior secondary leavers, youth with learning and/or work experience interested in business, young untrained women with family responsibilities?

It is clear that in the current situation planners are challenged to go beyond their traditional "turf" and become concerned with many aspects of educational, social and economic development. Much imagination and courage is required to reconsider activities and opportunities and display new visions. It will especially be interesting to consider the implications and possibilities of some very basic trends that are observable in the three domains with which we are concerned.

As a conclusion these trends are summarised here:

- the *vocationalization* of education: making education more directly work-oriented
- the gradual *de-formalization* of education: breaking through traditional features of curriculum structure, assessment, school organisation, school-community separation and incorporating more features that used to be special to non-formal programmes
- the recognition of different modes of skill acquisition and further *diversification of training:* this includes attempts to deal with the differential impact of the institutionalisation of skill acquisition on access to work
- move to bring training *closer to the work place*, and make training more work-based, whether simulated within the training environment or in the real world of work
- a gradual *blurring of boundaries* between the domains themselves: each of them becomes less of what it exclusively was in the past and linkages are breaking down the firm boundaries
- a greater willingness even to explore possible *combinations* of education, training and production, not as one subservient to the other, but by devising arrangements whereby full education components go hand in hand with full production or training components.

C. In-formal sector

Recently informal sector activities have been expanding in the developing countries. At present this sector accounts for nearly 50% of urban employment. The fast expansion of the sector leading to income and employment generation has, in fact, attracted the attention of the planners and policy makers, and it has become a central theme of policy discussions.

The emergence and expansion of the informal sector can be seen from at least two perspectives. First, it can be seen as the response of the economic system to bring back its productive activities to its own natural environment. Most of the developing countries were subsistence agrarian economies before the advent of colonialism. Production was centred around households and skill formation was a part of the work process itself. The superimposing of colonial industrial structures on these agrarian economies destroyed and distorted the then existing pattern of production. Tiny industrial enclaves commonly referred to as modern sectors of the economy emerged. Perhaps, this was a deviation from the natural process of growth of these economies. The trend towards informal sectors in the post-independence period in many of the developing countries can be seen as an attempt to correct the distortions that resulted from colonialism.

Second, the expansion of the informal sectors in the recent past is attributed to various factors contributing to the decline of economic growth and deterioration of unemployment situations in many of the countries. The recent recessionary tendencies in the developed market economies has had an impact on the developing countries leading to:

(i) a slow growth of employment in the modern sectors. In certain cases there was virtual stagnation of employment. In others, employment opportunities in the modern sectors declined in absolute terms resulting from retrenchment policies; this has made the modern sector to be considered no longer reliable for further generation of employment.

(ii) Real wages especially of those employed in the formal sectors declined rather sharply in many of the developing countries. This had some consequences

consequences with respect to current and future employment. First, it brought down the wage disparities between rural and urban areas which discouraged rural-urban migration. Second, it resulted in reducing the wage gap between the formal and informal sectors within urban areas. Jobs in the informal sector became more attractive. People from the formal sector started seeking jobs in the informal sectors, and even those still employed in the formal sector started looking for second jobs in the informal sectors.

These two factors have contributed to a sudden growth in the informal sector and self-employment activities. Many people find informal sector activities to be monetarily more lucrative.

How to deal with informal sector activities

The pre-occupation of policy makers is how best to deal with informal sector activities. There are different points of view in this regard.

(i) Formalise the informal sector activities. The advocates of this policy feel that formalising the informal sector activities will benefit the employees in terms of stability of employment and wages on the one hand and will benefit the state in terms of tax revenues. However, the argument is not to formalise all informal sector activities but only those which have become large and viable enough to be formalised.

(ii) Keep it as it is. Too much intervention from the government may destroy these activities; Zimbabwe follow this policy.

(iii) Link it with the formal sector. This will enable informal sectors to be feeder grounds to formal sectors. Close linkages between the two sectors will be mutually beneficial.

(iv) Comprehensive micro-enterprise policy. Every government in the developing countries should have a comprehensive policy on small enterprises rather than evolving policies related to certain aspects in these sectors. Such policies should encompass funding facilities, training patterns and employment opportunities.

The role of education: some policy options

The present day educational system is tuned more to meet the requirements of the modern sectors. The emergence of informal sectors calls for a change in the orientation of the educational system and training facilities.

Some of the options may be as follows:

(i) Imparting training as part of the existing school system;
(ii) Introduction of vocational courses;
(iii) Vocationalisation for work orientation;
(iv) Vocationalisation for job-specific practical skills;
(v) Providing training before job entry in separate institutions of training;
(vi) On-the-job training;
(vii) Retraining.

APPENDIXES

Appendix I

Opening address by the Hon. K.P. Morake, Minister of Education

Tuesday 27 June, 1989

Mr. Chairperson,
Ladies and Gentlemen/Bagaetsho

Unemployment among young educated people, in particular people at the Junior Certificate or JC level, is the greatest challenge facing Botswana today, exceeding in its long-term importance all the many other challenges we face, and it is essential that we give priority to tackling its causes. And, of course, Botswana does not have this problem on its own, even though it may be later than many other countries in experiencing it.

I therefore see this workshop on *education, employment and work* as being very important - a very timely contribution to increasing our understanding of the relationship between *education planning and manpower planning* - and an excellent opportunity for exploring some of the misconceptions that abound in this field.

Several different factors have worked together to create steadily growing unemployment among our young educated here in Botswana. The biggest and most serious is the rapid rate of our population growth. Botswana is creating new jobs at a very fast rate, faster than most other countries in the world, but as fast as we create the new jobs, we are creating new Batswana even faster.

Our very rapid population growth is contributing markedly to the increase in unemployment among our young educated, and if we want to bring down the unemployment rate in the long term then we have to do something effective *now* to slow down our population growth.

Another factor in this situation is that we are expanding our education system very rapidly, especially at the junior secondary level. As a result, every year, thousands of JC leavers enter the employment market. Becuase they hold Junior Certificates, these young school leavers see themselves as being educated, and are therefore very reluctant to face the reality of that employment market.

The reality of the employment market is that there are no longer clerical and similar jobs for JC leavers as there have been, traditionally, ever since independence. Those jobs are now being taken by steadily increasing numbers of Form 5 leavers who are now available. To add to the problem, JC leavers are increasingly young and immature, a trend which potential employers are quick to identify.

But, because they think of themselves as being "educated" these relatively young and immature school leavers are very reluctant indeed to consider returning to traditional rural life. The cattle post and lands are certainly not high in their priorities, so many of them in effect choose unemployment rather than choosing to return to agriculture and livestock.

Yet another contributing factor is a widespread lack of marketable practical skills among our young educated. We can be pround of the way in which wer have expanded our education system since independence, and on the particularly rapid expansion that is taking place at present at the junior secondary level. But we must not let our pride blind us to the face that we still have imbalances and shortcomings in the system.

One of these imbalances is that we have not been able to expand our skills training as fast as we have been able to expand the more academic aspects of the education available. The result is that we are in great danger of creating a situation of "*too much education and too little training*". Already we have the anomally of unemployment among the young educated existing side by side with a great shortage of artisans.

In an attempt to right this imbalance, the Government has recently expanded technical education opportunities by the creation of Vocational Training Centres, or VTCs, in various parts of the country. However, the VTC system is very heavily dependent on employers sponsoring students under the apprenticeship scheme, and this has not yet developed its full potential.

In addition to giving training to apprentices, the VTCs do provide some full-time training for school leavers, but only for a relatively limited number, and even those lucky school-leavers who do get places are still dependent on later getting sponsorships from employers to complete their courses.

It is already clear that the VTCs on their own will not be a total answer to the anomaly I have described, that is, a shortage of artisans in parallel to growing unemployment among the young educated.

Obviously we have to do more, and reforms in the junior secondary curriculum, for example, the inclusion of agriculture as a required core subject, and technical studies and home economics as options, are other steps in the right direction. However, even the present reform of that curriculu, to make it more practical, may not be enought to right the imbalance, so we would greatly welcome any suggestions that this workshop could make as to what additional steps we could consider in order to avoid having "too much education and too little training".

For example, should we explore the possibility of asking the private sector to contract to run very intensive courses in skills training, under careful Government monitoring of the standard of training?

The private sector has already taken the initiative to run such training in one or two fields, for example in computer operation. Could it be asked, on a commercial basis, to organize rapid training in some other fields of work in which Botswana has a shortage of skilled people? What do you as members of this workshop think of such an idea?

What about self-employment in the informal sector? This may be the only choice for many of our JC leavers. But how do you prepare them for it? What kind of work do you encourage them to consider? How do you give them the skills they need? Perhaps even more important, how do you give them the attitudes they need?

Whilst still at school, junior secondary students are all certain that they will be successful and pass into senior secondary school. A recent informal survey of some Form 2 students showed that one hundred percent expected to be in Form 3 next year. Even after it was clearly explained to them that there are places in Form 3s for only half of the output of Form 2s, still one hundred percent of them expected to be in Form 3 next year.

This refusal to face reality makes it very very difficult indeed to get junior secondary students to even consider the possibility that they might have to be self-employed, and is a huge handicap to give them any relevant training while they are still at school. Should we consider developing "self-employment preparation units" at junior secondary schools with the aim of serving both current students and also former students who may be more willing to accept such training after they have experienced a period of unemployment? What do you as workshop members think of that as an idea?

In other words, I am telling you that we are very open and receptive to any constructive criticisms and suggestions that may emanate from your deliberations over the next three weeks.

However, I very sincerely hope that you do not suggest the creation of more senior secondary schools as an answer to unemployment at the junior secondary level. It is already very clear from the developing employment situation for Form 5 leavers that to create more senior secondary schools would be merely to create the same unemployed educated problem at a different level.

No, what we need to do is to tackle the problem at its present level, that is at junoor secondary, before it spreads to higher levels. I look forward to hearing your conclusions and suggestions.

And it is in that spirit of receptiveness to your constructive suggestions that I now declare this workshop on *education, employment and work open. PULA*.

Appendix II

Closing statement by the Minister of Presidential Affairs and Public Administration The Hon. P. H. K. Kedikilwe

Friday, 14th July, 1989

Mr. Chairman,
Ladies and Gentlemen

It gives me great pleasure to be here today to officiate at the end of a workshop which, over the past three weeks, has been preoccupied with the very important topics of education, employment and work as well as the relationship between manpower planning and educational planning.

The topics appeal to me both as Minister responsible for public administration and as a Motswana concerned about the need to educate Batswana and equip them with skills that will make them not only employable but also capable of creating job opportunities for themselves and hundreds of thousands of other Batswana. I therefore hope that your deliberations have resulted in resolutions that the various countries and organisations that you represent can find useful and implementable.

Mr. Chairman, over the last five years, Botswana has crossed a watershed as far as education and employment are concerned. This is serious enough in itself, but to cross it without coming to terms with its implications is potentially disastrous. I am referring to the very big change that is in progress in this country in the relationship between educational qualifications and available employment. From Independence until less than five years ago, if a Motswana obtained education up to Junior Certificate level or beyond it meant that he or she could be almost certain to get a formal sector job. In other words from Independence until but a few years ago, *Education equalled employment.*

That is no longer so. The situation has changed markedly. Education no longer automatically equals employment. Every year, our greatly expanded network of junior secondary schools pours out thousands of relatively young and immature Junior Certificate (or JC) leavers, many of whom can obtain neither senior secondary places, nor other training or employment. And our expanding senior secondary schools are producing their own increasing output of Cambridge School Certificate leavers who are taking almost all the employment and training opportunities previously available to JCs. For the first time since Independence we are now experiencing significant levels of unemployment among young educated people who previously were being absorbed into the modern sector. This is, of course, to say nothing of thousands of primary school leavers and other able bodied Batswana elsewhere in the country.

Botswana, like other countries at its level of socio-economic development, indeed, faces major challenges. In recognition of this the Government has, over the past few years, intensified its search for solutions. During the National Development Plan VI, the Government of Botswana not only increased secondary school and University places, but it also established a manpower planning capability within the Directorate of Public Service Management and the newly created Employment Policy Unit within the Ministry of Finance and Development Planning with the specific task to:

> (a) ensure that Botswana's limited supply of skilled manpower is allocated where it is most needed and
> (b) ensure that education and training programmes respond to the long-term needs of the economy.

As you may have concluded during your deliberations here, the solution to the problem of unemployment and lack of rewarding work lies in the provision not only of formal education, but equally or more importantly, skills through training so that the workforce is prepared to create employment and work for itself. While you may have already exchanged experiences from the countries and organisations you represent, I thought it might not do any harm to briefly review our efforts in this area.

In an endeavour to create and develop a skilled labour force the Government enacted the Apprenticeship and Industrial Training Act in 1983 whose main goals are:

> (a) to increase the income and living standard of the citizens of Botswana by imparting more sophisticated skills;
> (b) to increase the manpower for the fastest possible rate of economic growth;
> (c) to secure a rapid expansion of employment opportunities;
> (d) to replace as many expatriates as possible by well trained citizens of Botswana.

The *modus operandi* of the apprenticeship scheme provide for a four-year training programme entailing the training of apprentices on the job for nine months in each year at the employer's work place in addition to which they attend Vocational Training Centres for thirteen weeks for theoretical training. The final examination at the end of the training period leads to a National Craft Certificate which is a nationwide recognised certificate for artisans.

It should be understood that while the apprenticeship scheme does not necessarily increase job opportunities in the country by itself, it does increase skilled manpower for jobs currently occupied by expatriates as well as develop a pool of skills which in themselves act as an incentive for foreign investors who in turn invest in this country with the result that, hopefully, more jobs can be created.

Mr. Chairman, I wish to return once again to the question of employment creation and state that while the ultimate solution lies in increased job opportunities in the informal sector, properly designed government and parastatal development programmes can contribute significantly to the alleviation of the problem if the employment intensity goal is constantly kept in view.

We do have labour-intensive road building programmes under the Ministry of Local Government and Lands (LG34) to provide rural employment, but they are limited in scope compared to the thousands who are queuing up for this type of employment. We also have the Financial Assistance Policy (FAP) as a job creation initiative, but youngsters of 15 or 16 with just a little education and even less practical training are in no position to take advantage of the assistance offered. It may well be time for forums such as this one to address the question of employment opportunities for the youth who cannot, for various reasons, continue with their formal schooling.

Mr. Chairman, I wish to conclude these closing remarks by undertaking a brief overview of initiatives launched by the Government of Botswana in the recent past which, I believe, if implemented in earnest by all concerned will significantly add to job opportunities in this otherwise vibrant economy.

Some of you may be aware that the Government has recently decided to undertake a major study of water resources in the country with a view to locating them and assessing their potential with a view to ensuring long-term guaranteed supply for human and livestock consumption on the one hand and irrigation on the other. A consortium of international firms is scheduled to start an 18-month consultancy on the so-called Water Master Plan. It is our hope that this exercise will lead to the opening up of several parts of this country to irrigation which is a much needed supplement to our drought-prone dryland farming. Preliminary research indicates that the potential exists for the creation of between three and five permanent jobs on a hectare of vegetables and between one and three jobs on a hectare under cereal crops. Experience also shows that more jobs per hectare could be created if cotton-growing were to be undertaken by more farmers as this is a highly labour-intensive and lucrative crop.

Another area where the Government hopes to create employment opportunities both directly and indirectly is in the implementation of a programme known as Major Development Initiatives which was put together during the mid-term review of our sixth National Development Plan. These initiatives consist of projects into which Government intends to make a one-off major capital injection without any commitment to long-term recurrent funding. Examples of these include the proposed new tannery, a diamond cutting project and the accelerated land servicing programme aimed at combatting the serious shortage of serviced land for all sorts of development, especially in urban areas.

Mr. Chairman, I have probably gone on for much longer than it is customary at a closing ceremony. But this is because I believe that where efforts are already being made, they should be recognised so that debate should focus on making improvements where necessary. As I indicated earlier, I also hope that your deliberations and conclusions arising out of this seminar will assist us in tackling the problems of lack of skills and unemployment that have plagued, and continue to plague, many a developing African country.

It is now time for me to thank the sponsors of this Seminar: the National Institute of Development Research and Documentation and the Unesco International Institute for Educational Planning. I strongly believe that it is important to conduct forums such as this one from time to time to enable us to learn from one another's experiences.

Appendix III

Regional intensive training course on education, employment and work

Gaborone, 27 June - 14 July 1989

Module 1: Introduction

Tuesday, 27 June (University of Botswana Auditorium)
8.15 Welcome address by Prof. A. Datta, Director, N.I.R.
8.30 Official opening by the Hon. K.P. Morake, Minister of Education
9.00 Education and Employment - An Overview (B.Sanyal, IIEP)
Discussion
10.00 Tea/Coffee
10.30 Presentation of participants and resource persons. (Seminar room)
11.15 Seminar programme
12.00 Presentation of national cases in working groups
12.30 Lunch
14.00 Presentation of national cases (continued)
15.15 Tea/Coffee
15.30 Presentation of national cases (continued)
16.30 End of day

Wednesday, 28 June
8.00 *Plenary:* Reporting back from group presentation of national cases
10.00 Tea/Coffee
10.30 *Plenary:* Diagnosis of Education - Employment Situation
- Basic concepts (N.V. Varghese, IIEP)
11.00 Diagnosis of Education - Employment Situation - Practical exercise in working groups
12.30 Lunch
14.00 Practical exercise (continued)
15.15 Tea/Coffee
15.30 *Plenary:* Discussion of results of practical exercise
16.30 End of day

Module 2: Manpower Approach to Educational Planning

Thursday, 29 June
8.00 *Plenary:* Estimation of Manpower Supply and Demand (B. Sanyal, IIEP)
9.30 The Botswana Manpower Planning Model (T. Nyamadzabo, Ministry of Finance and Development Planning)
10.00 Tea/Coffee
10.30 Introduction to exercise on Manpower Supply and Demand (B. Camara, BREDA and N.V. Varghese, IIEP)
11.15 Practical exercise in working groups
12.30 Lunch
14.00 Practical exercise (continued)
15.15 Tea/Coffee
15.30 Practical exercise (continued)
16.30 End of day
19.00 Reception

Friday, 30 June

8.00 Practical exercise (continued)
10.00 Tea/Coffee
10.30 Practical exercise (continued)
12.30 Lunch
14.00 Practical exercise (continued)
15.15 Tea/Coffee
15.30 Practical exercise (continued)
    Reading assignment for weekend
16.30 End of day

Saturday, 1 July

8.00 Departure by bus to Kanye
    Visit to Rural Industrial Innovation Centre
    Lunch in Kanye
16.00 Arrival back in Gaborone

Dinner outside campus

(Optional computer exercises during weekend)

Monday, 3 July

8.00 *Plenary:* Discussion of exercise on Manpower Supply and Demand
10.00 Tea/Coffee
10.30 *Plenary:* A Critical Review of Manpower Approach to Educational Planning
    (Panel: Sanyal, Odotei, Perrings, Salkin)
11.30 Discussion
12.30 Lunch

Module 3: Other Approaches to Relate Education with Employment

14.00 *Plenary:* Earnings Functions (Sanyal, Kann)
15.15 Tea/Coffee
15.30 Earnings Functions (continued)
16.30 End of Day
Evening: Film Show "The Diploma Disease"

Tuesday, 4 July

8.00 *Plenary:* Theories of Labour Market (Sanyal, Varghese)
9.00 *Plenary:* Tracer Studies (Sanyal, Kann, Chilisa)
10.00 Tea/Coffee
10.30 Discussion
11.00 Practical exercise on Tracer Studies (in groups)
12.30 Lunch
14.00 Practical exercise (continued)
15.15 Tea/Coffee
15.30 Discussion of exercise on Tracer Studies
16.30 End of day

Module 4: Strategies for a Better Match between Learning and Work

Wednesday, 5 July

8.00 *Plenary:* The Informal Sector (K. King)
Discussion
9.30 Preparation of the fieldwork on informal sector in Gaborone (Kann)
10.00 Tea/Coffee
10.30 Film: The story of a Lesotho woman
11.30 Fieldwork on informal sector and preparation of report
16.30 End of day

Thursday, 6 July

8.00 *Plenary:* Education and the Informal Sector (W. Hoppers)
9.15 Vocationalisation of Education (Kenyal, Zambia and Zimbabwe)
10.00 Tea/Coffee
10.30 Report and discussion of exercise on informal sector
12.30 Lunch
14.00 An Occupational Information System (OIS) for Botswana
(M.L. Nkambwe, Central Statistics Office)
14.45 Exercise on OIS
15.15 Tea/Coffee
15.30 Exercise (continued)
16.30 End of day
Evening: Film show "You might have to create your own job"

Friday, 7 July

8.00 Departure by bus to Mochudi to visit Mochudi Brigades
12.15 Arrival back in Gaborone
12.30 Lunch
14.00 *Plenary:* Education and Productive Work: African Experiences
(P. Van Rensburg)
15.15 Tea/Coffee
15.30 Discussion
16.30 End of day

Monday, 10 July

8.00 *Plenary:* Education and Productive Work (W. Hoppeers)
Discussion
10.00 Tea/Coffee
10.30 Botswana's Brigades (W. Sibanda, G. Wiman)
11.30 Botswana's Study-Service Scheme: Tirelo Setshaba
12.30 Lunch
14.00 Film: Serowe Brigades
15.15 Tea/Coffee
15.30 *Plenary:* Self-Reliance. What happened? (Malawi, Tanzania and Zambia
16.30 End of day

Tuesday, 11 July
8.00 *Plenary:* Gender Issues in Learning and Work (Kann)
Video and discussion
10.00 Tea/Coffee
10.30 *Plenary:* Girls and Women in the Brigades, (M. Ovekeen)
12.30 Lunch
14.00 Group discussions: The role of education in the informal sector
15.15 Tea/Coffee
15.30 Group discussions (continued)
16.30 End of day
20.00 Film (1): Labour intensive project of the local government
Film (2): Self employment in the informal sector

Wednesday, 12 July
8.00 *Plenary:* Presentation of group discussions
10.00 Tea/Coffee
10.30 Synthesis of strategies for a better match between learning and work
(Sanyal, Hoppers and Varghese)
12.30 Lunch
Afternoon free
20.00 Film (1): "Consequences": The teenage problem of training, employment in Zimbabwe
Film (2): Kenya youth national service

Thursday, 13 July
8.00 Individual work on "Possible use of the course in the participant's place of work"
10.00 Tea/Coffee
10.30 Individual work (continued)
12.30 Lunch
14.00 Evaluation and discussion
15.15 Tea/Coffee
15.30 Evaluation and discussion (continued)
16.30 End of day

Friday, 14 July
10.00 Address by Prof. T. Tlou, Vice-chancellor, University of Botswana
10.30 Presentation of certificates
11.00 Official closing by the Hon. P.H.K. Kedikilwe, Minister of
Presidential Affairs and Public Administration
11.30 Vote of thanks: Participants' representative and B. Sanyal, IIEP

Appendix IV
List of Participants

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